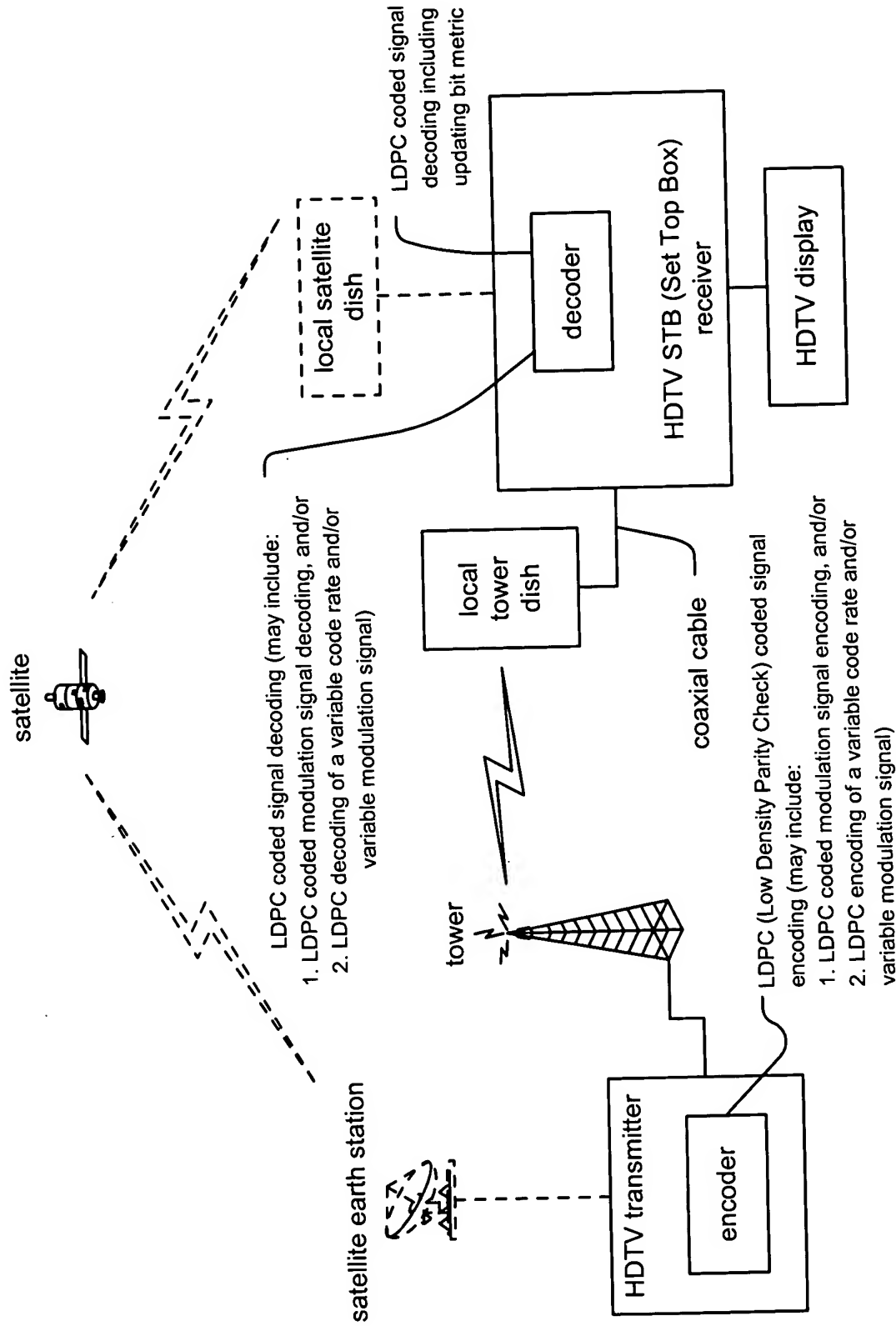


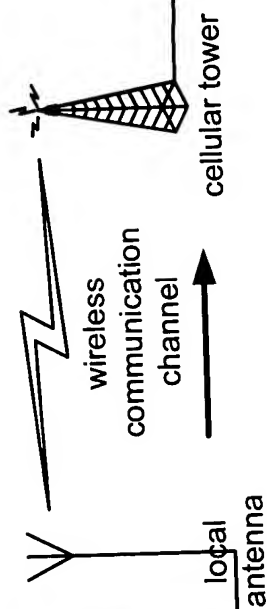
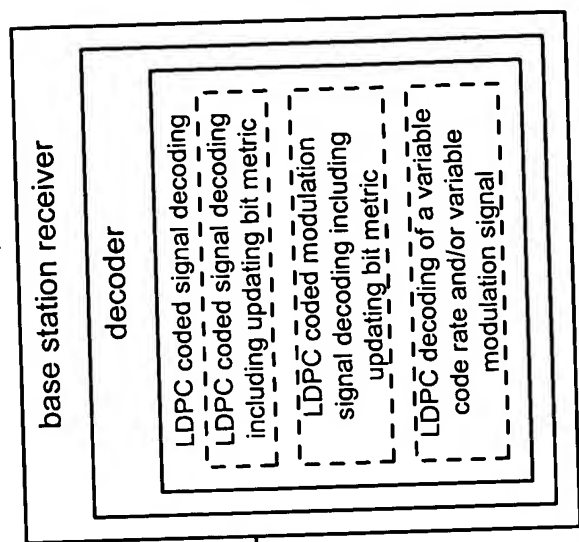
satellite communication system

**Fig. 1**



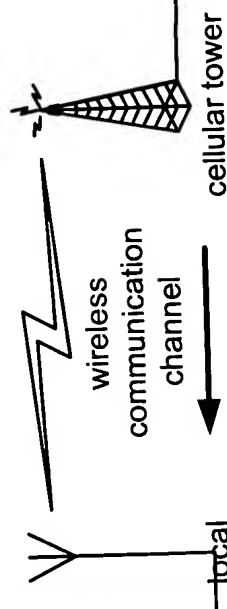
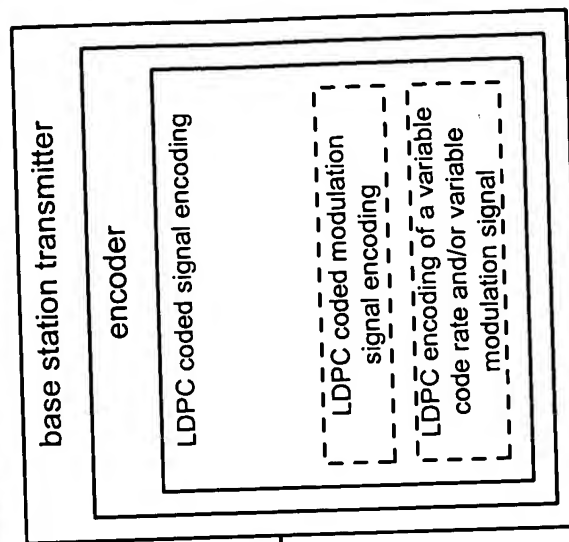
HDTV (High Definition Television) communication system

**Fig. 2**



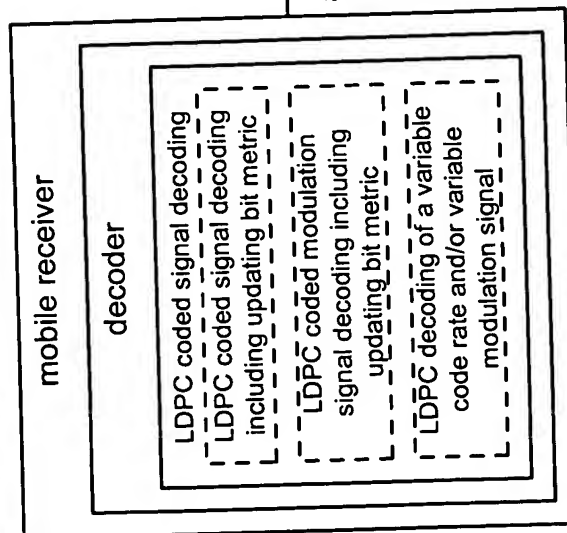
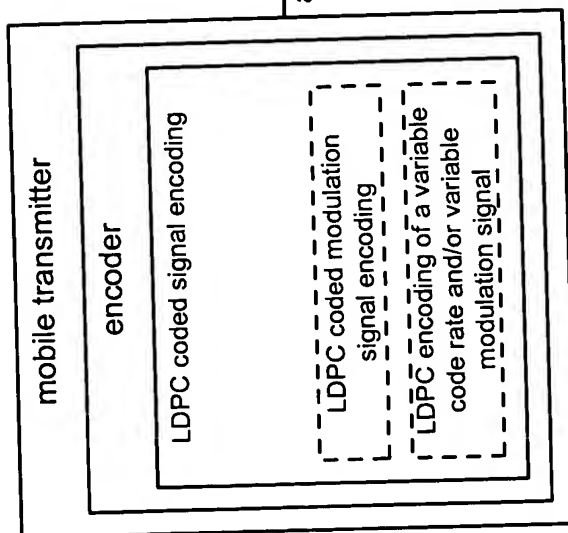
uni-directional cellular communication system

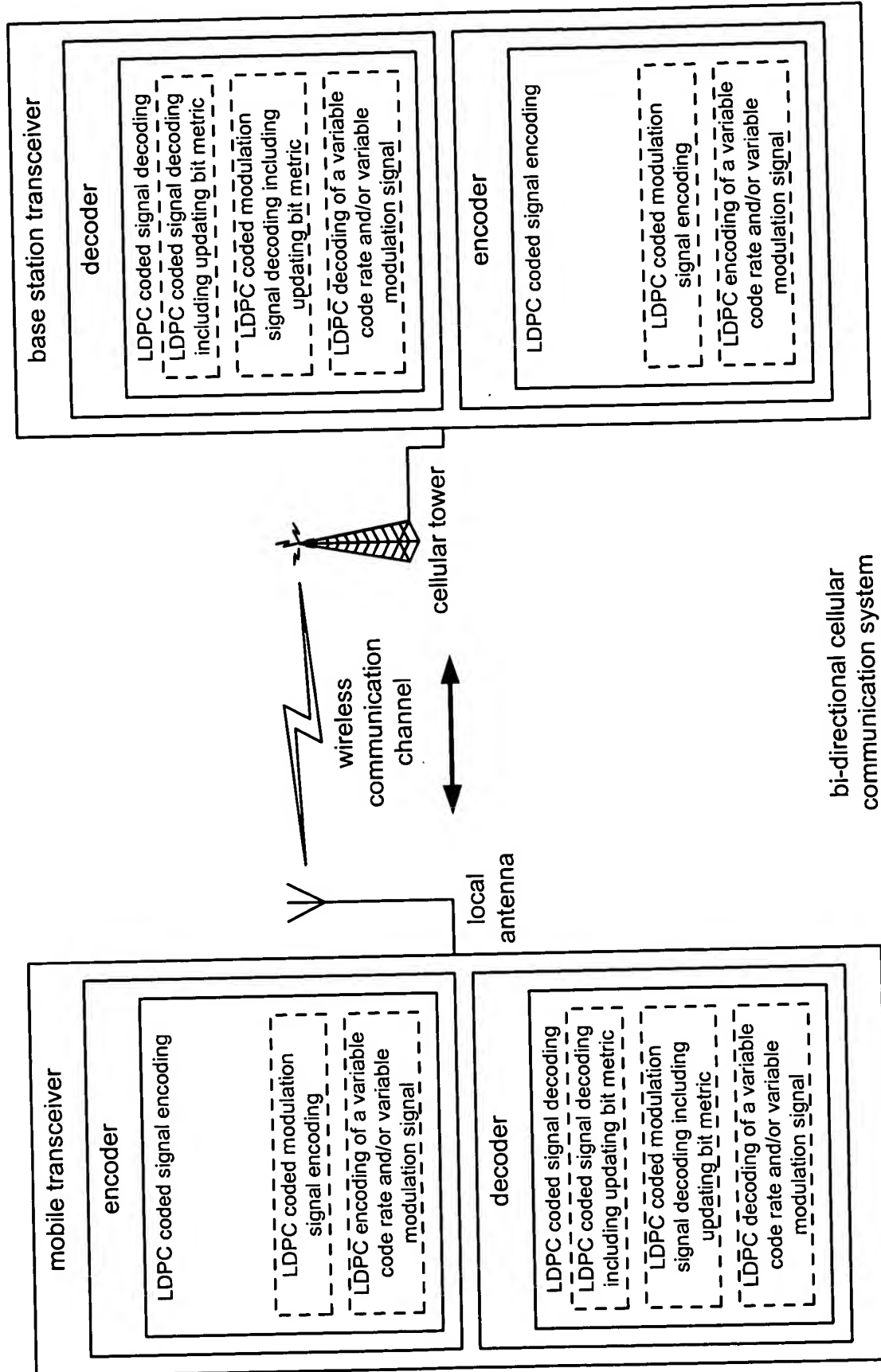
**Fig. 3A**



uni-directional cellular communication system

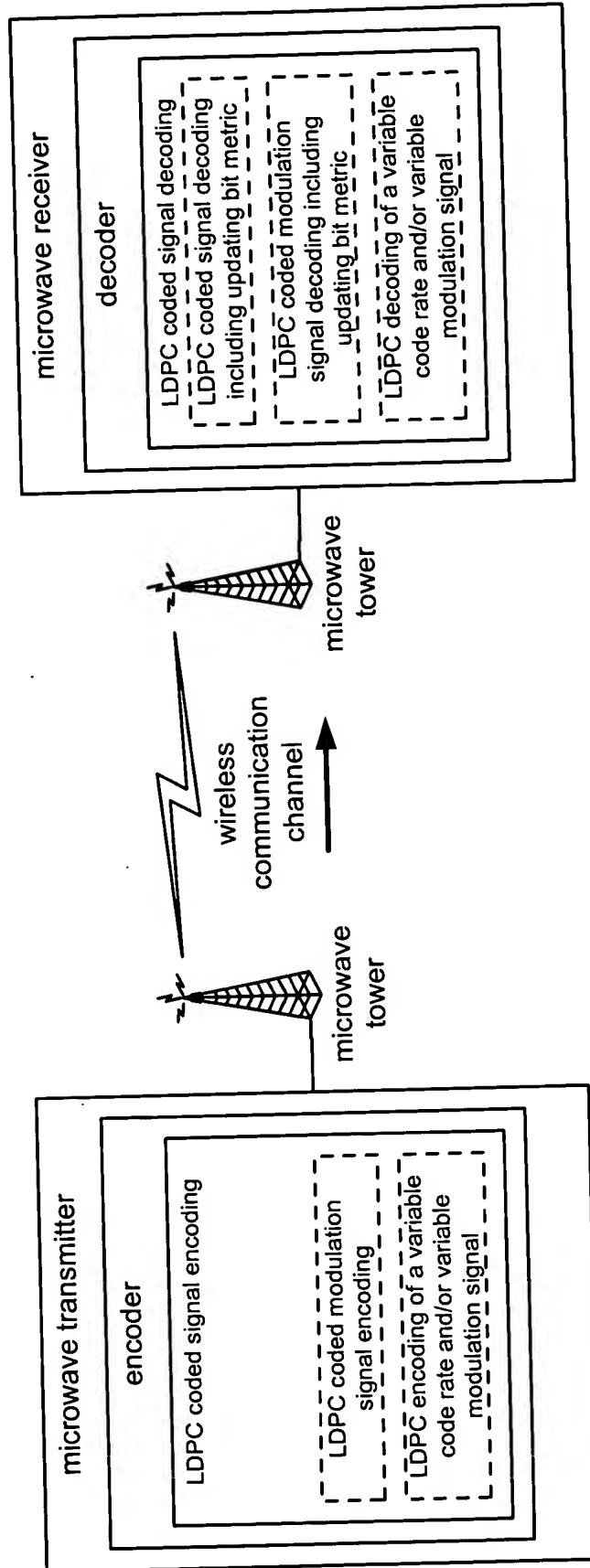
**Fig. 3B**





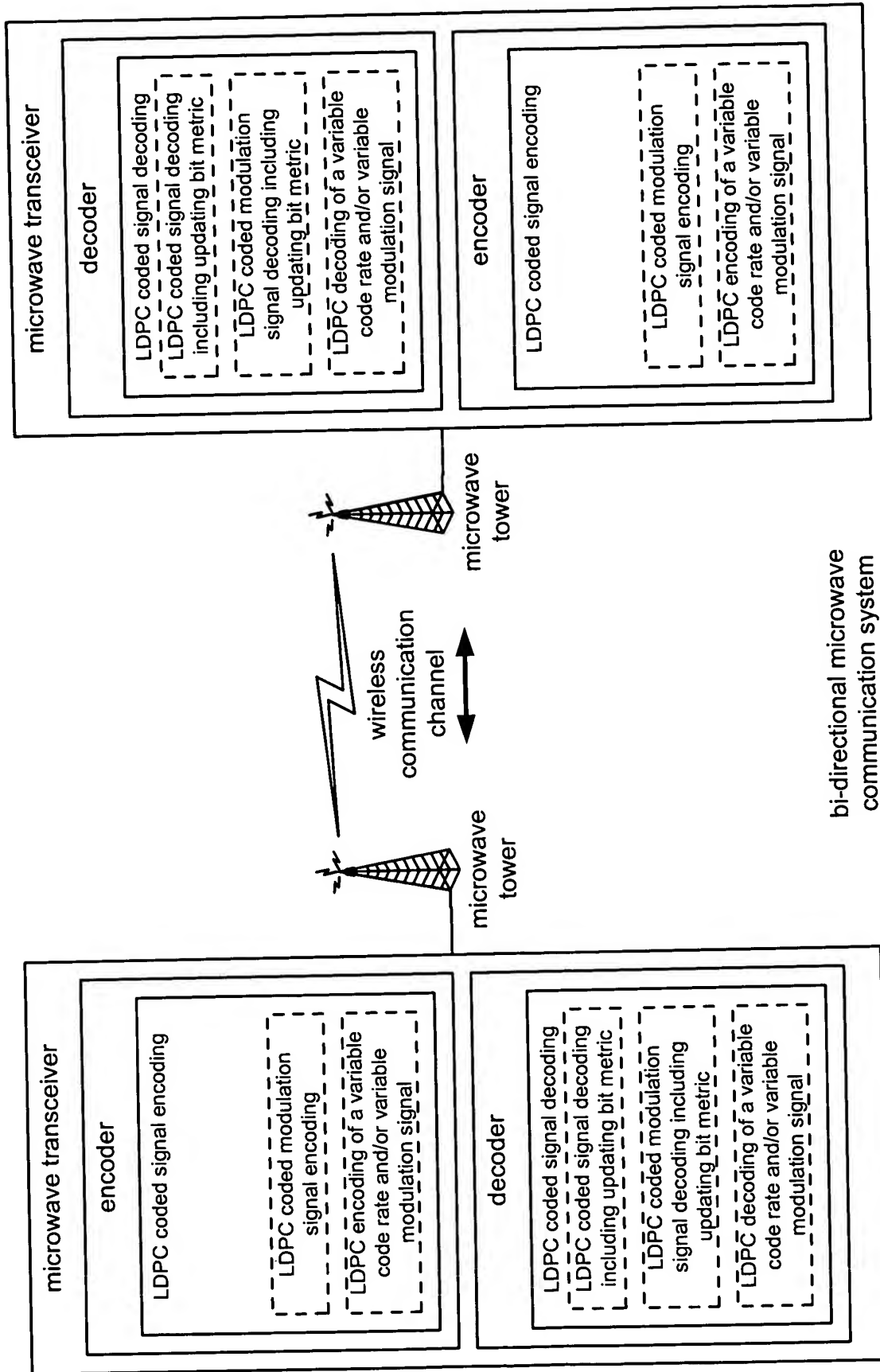
bi-directional cellular communication system

**Fig. 4**



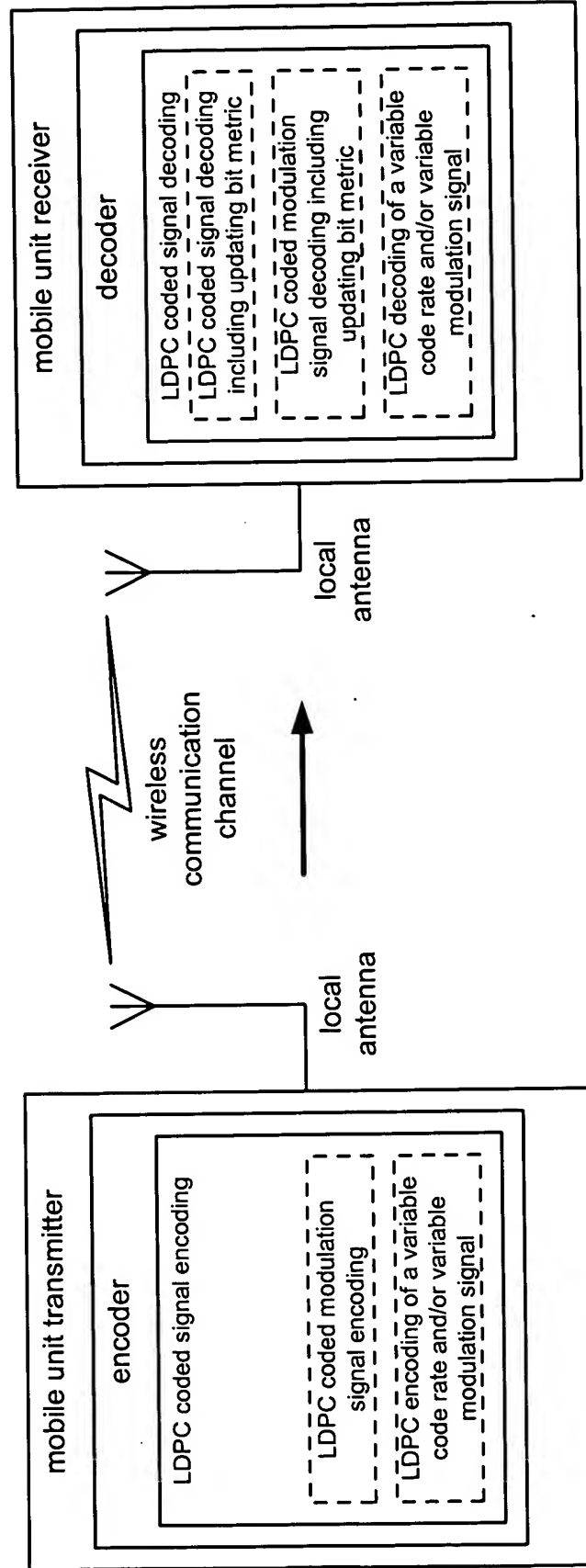
uni-directional microwave communication system

**Fig. 5**



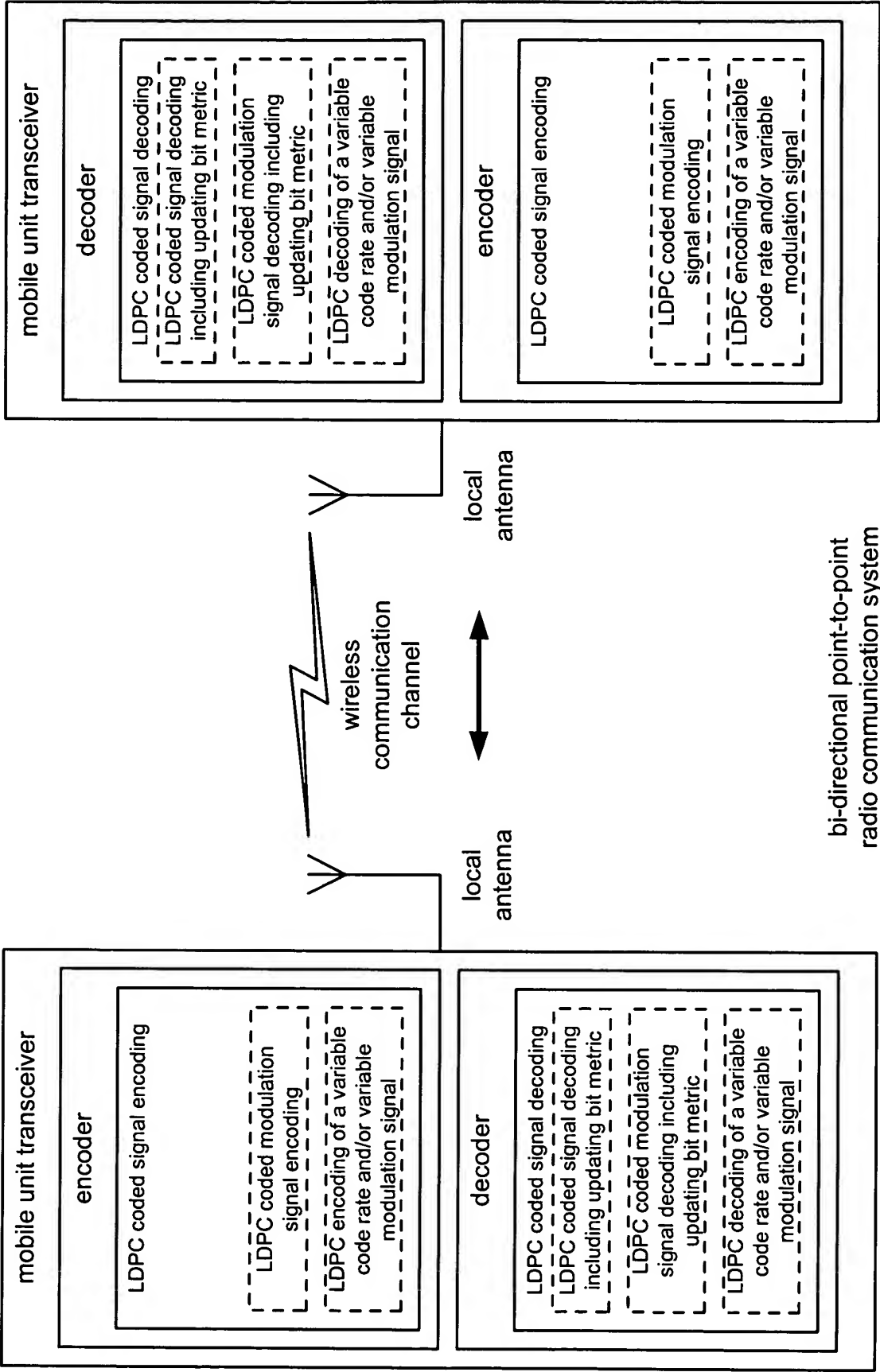
bi-directional microwave communication system

**Fig. 6**



uni-directional point-to-point radio communication system

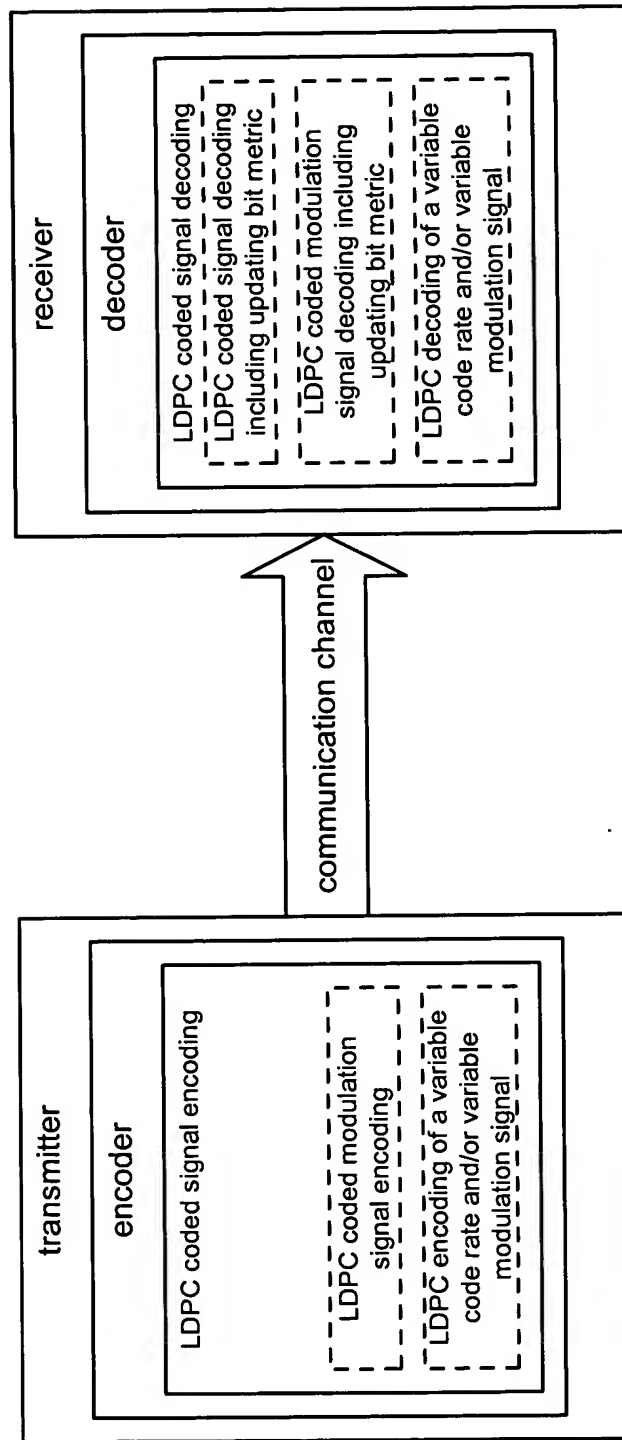
**Fig. 7**



bi-directional point-to-point  
radio communication system

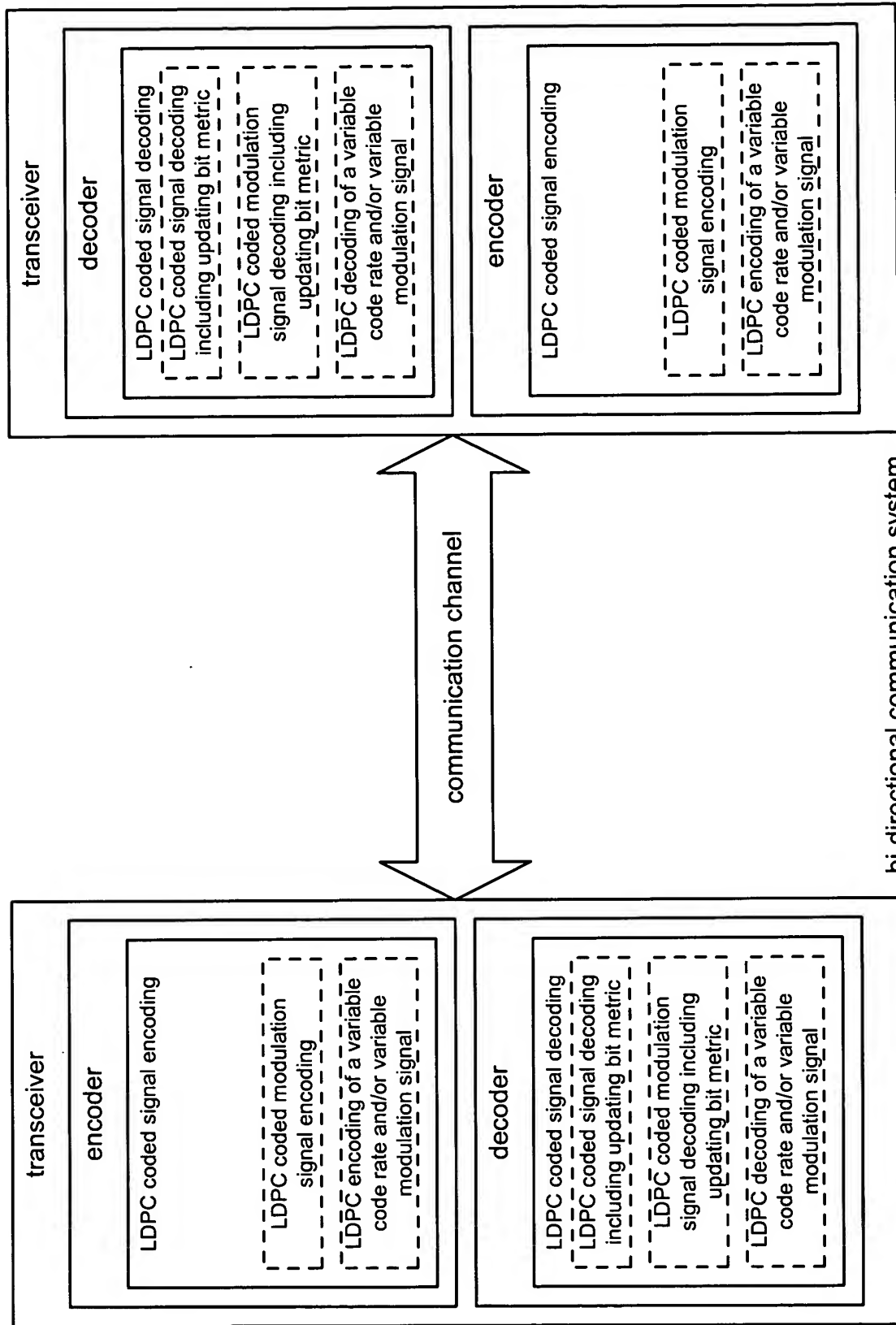
**Fig. 8**





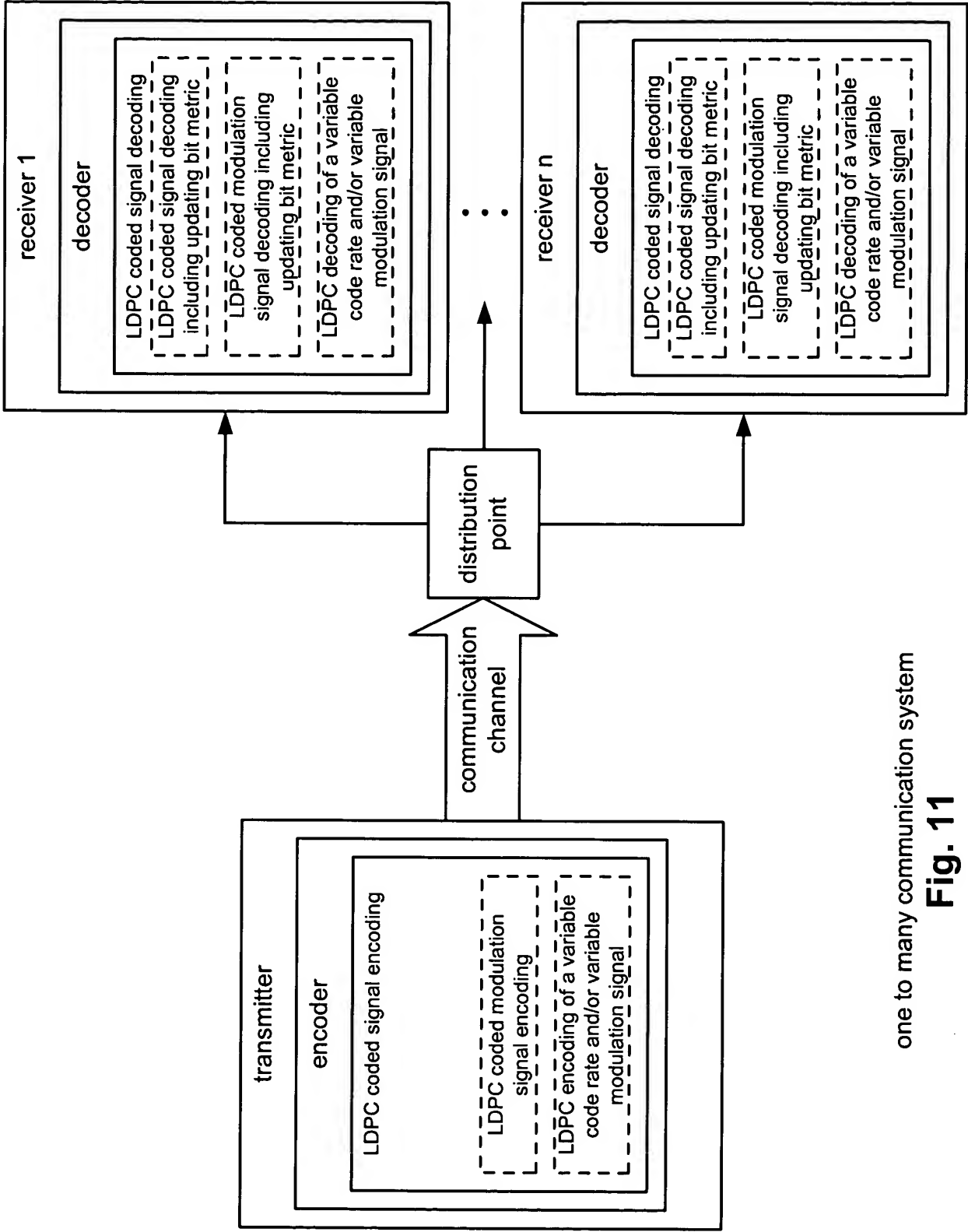
uni-directional communication system

**Fig. 9**



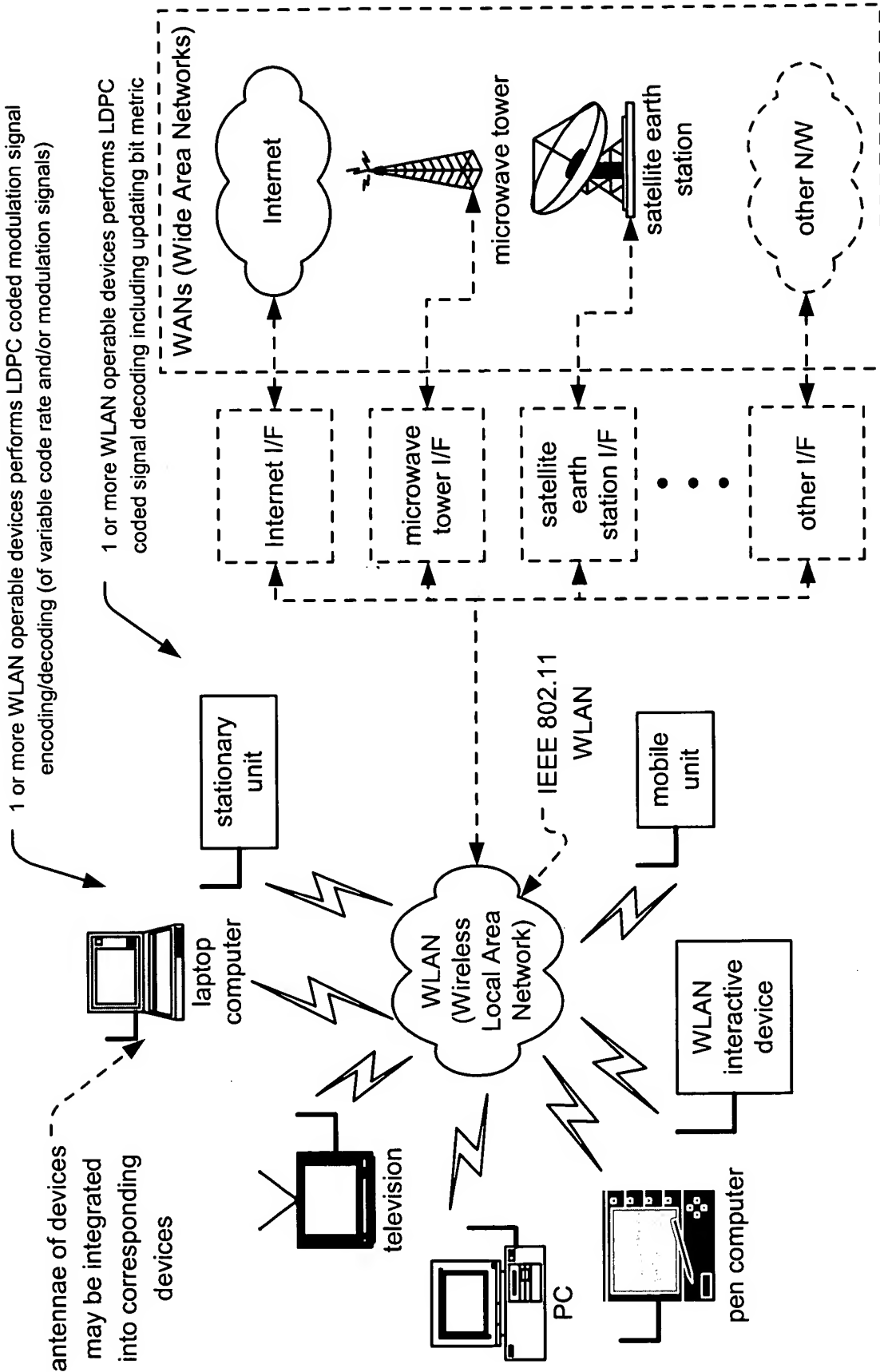
bi-directional communication system

**Fig. 10**



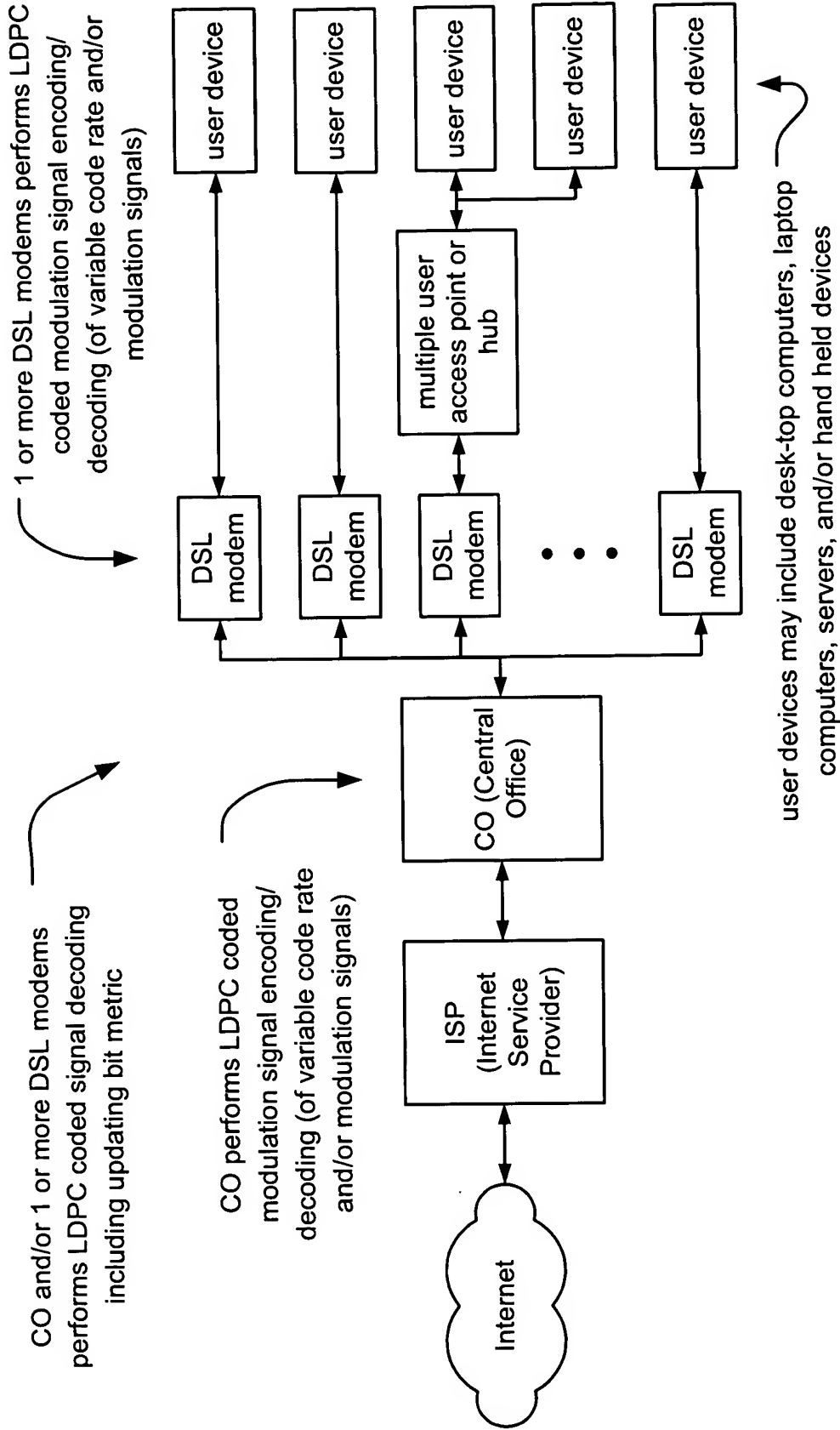
one to many communication system

**Fig. 11**



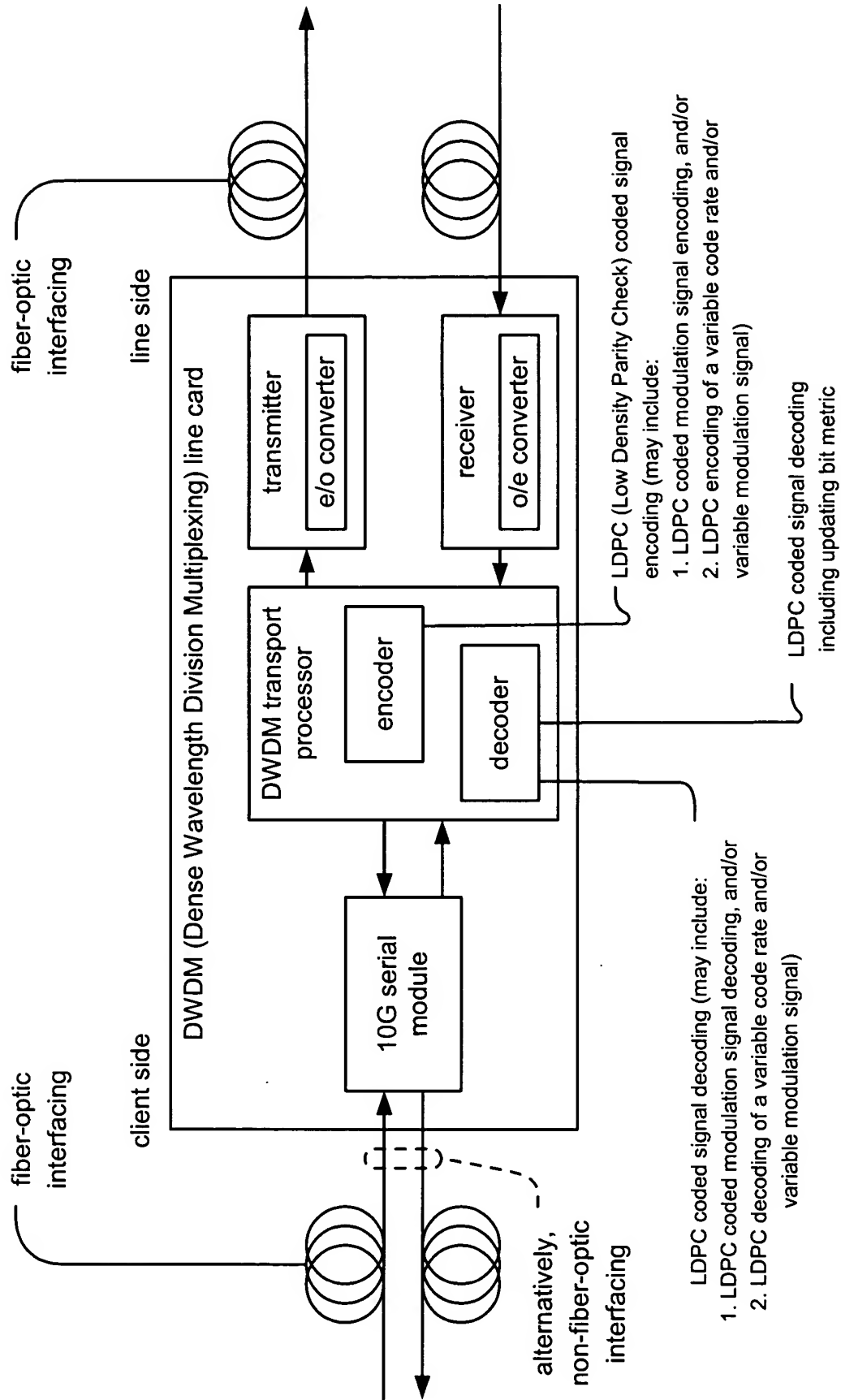
WLAN (Wireless Local Area Network) communication system

**Fig. 12**



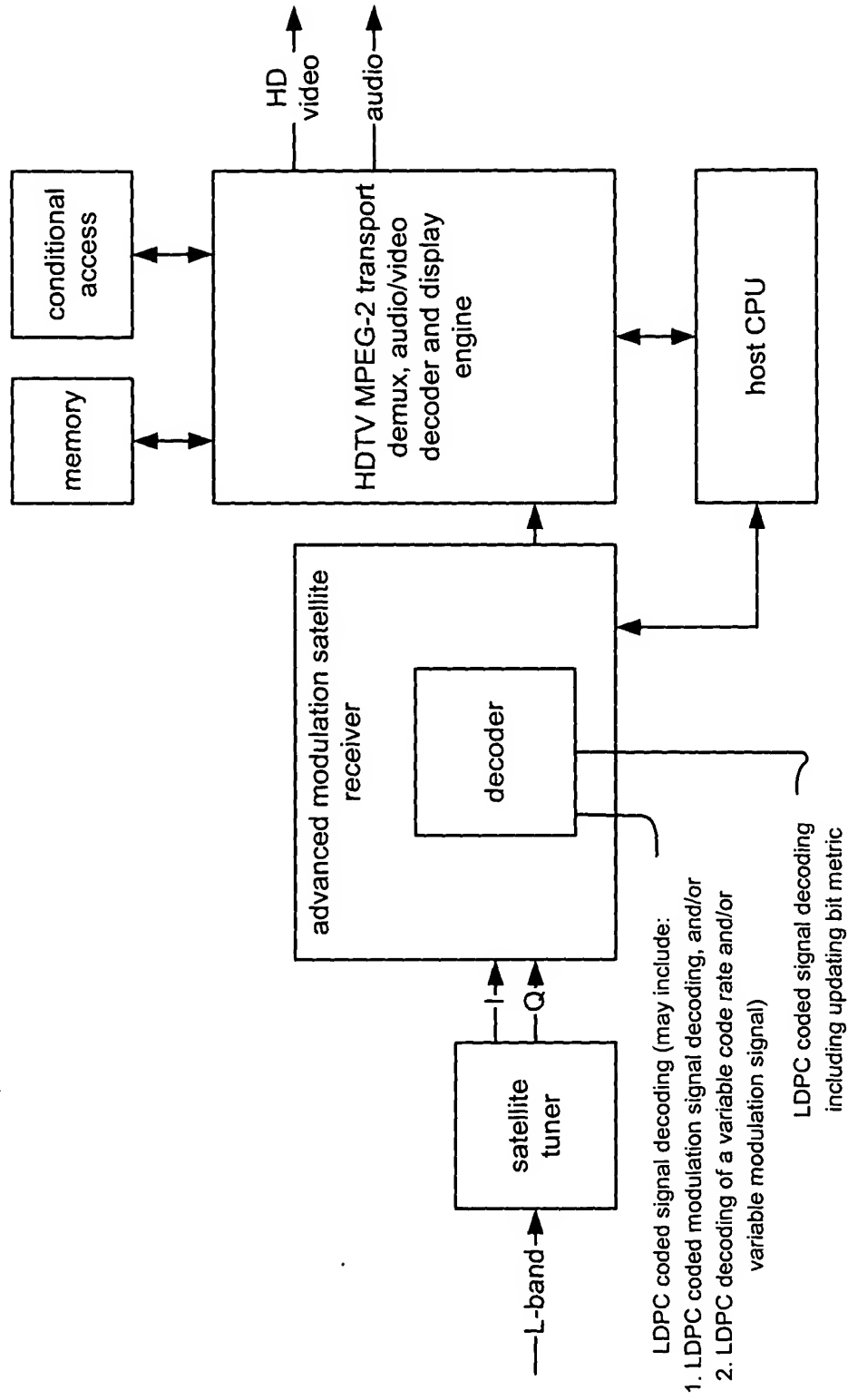
DSL (Digital Subscriber Line) communication system

**Fig. 13**

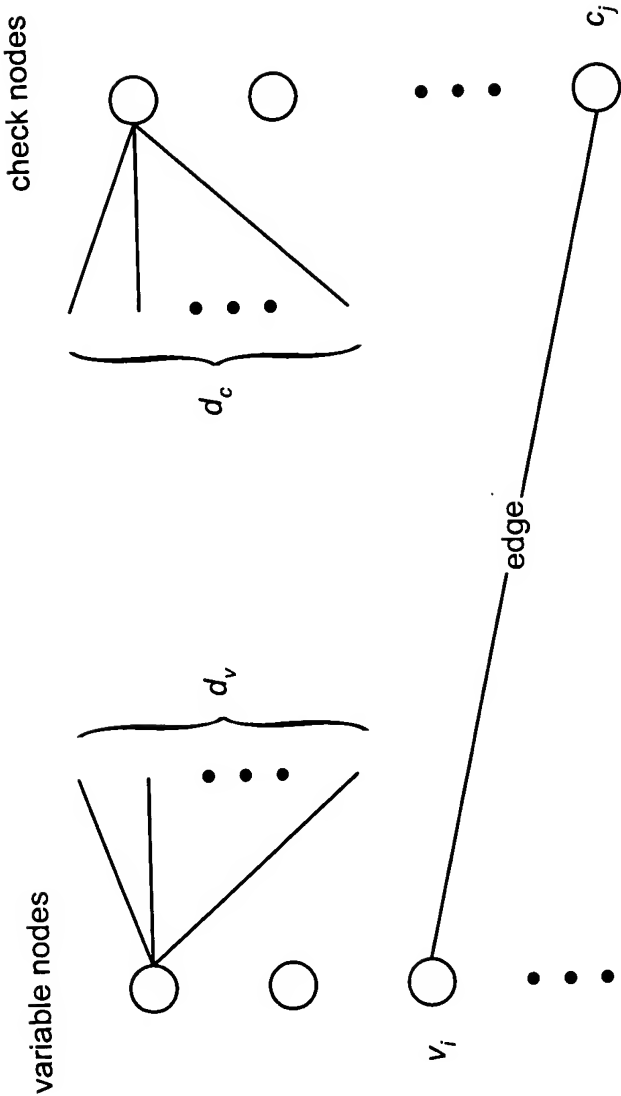


fiber-optic communication system

**Fig. 14**

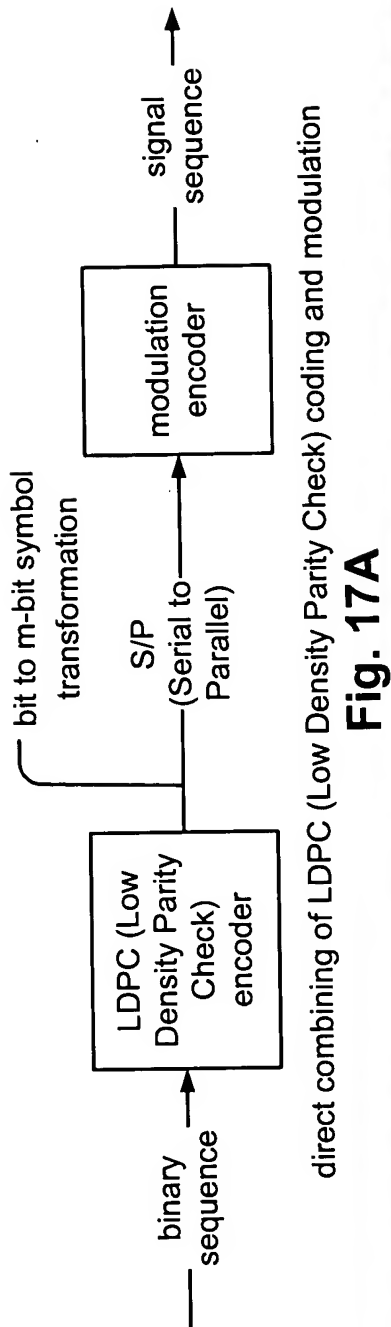


satellite receiver STB (Set Top Box) system  
**Fig. 15**



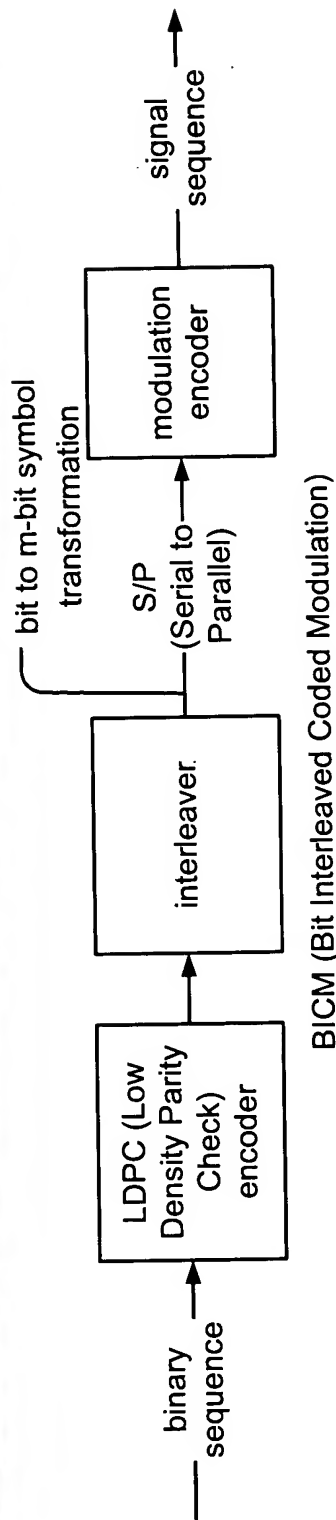
LDPC (Low Density Parity Check) code bipartite graph  
**Fig. 16**





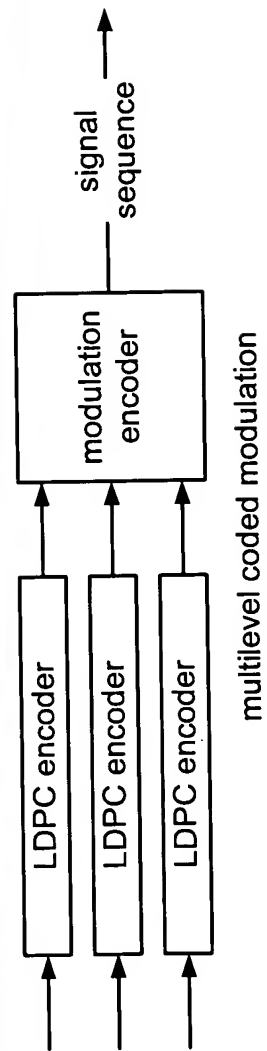
direct combining of LDPC (Low Density Parity Check) coding and modulation

**Fig. 17A**



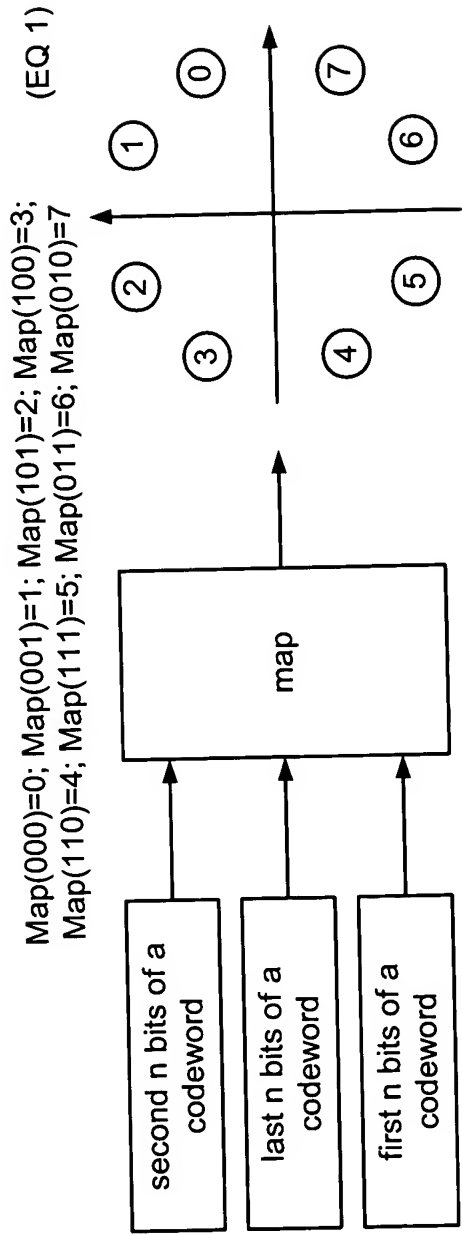
BICM (Bit Interleaved Coded Modulation)

**Fig. 17B**



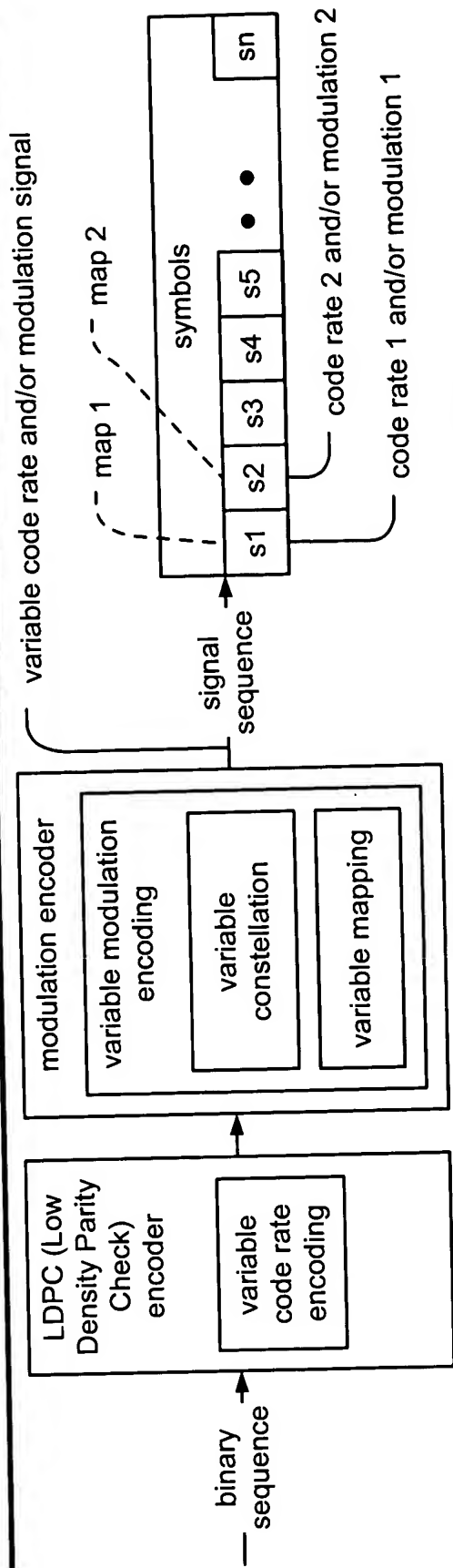
multilevel coded modulation

**Fig. 17C**



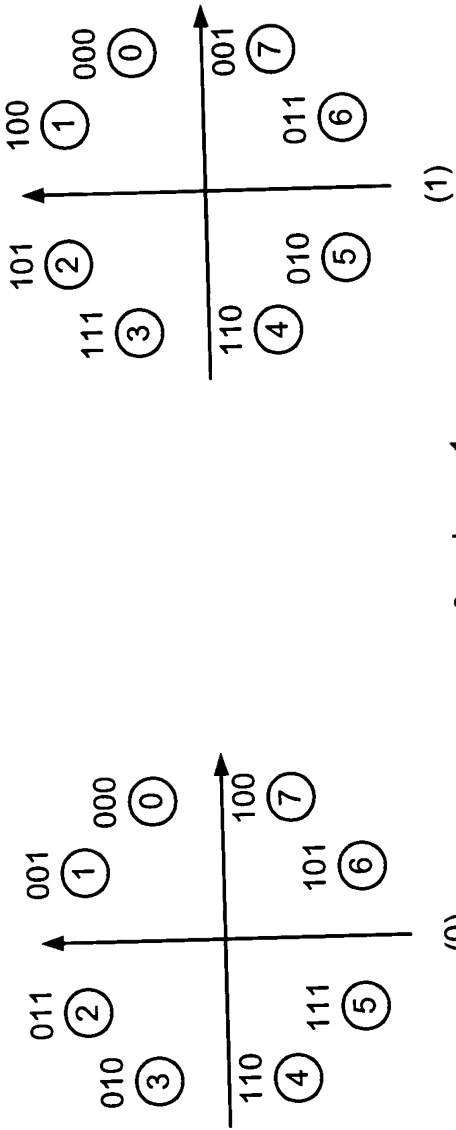
HNS (Hughes Network System) proposal to DVB (Digital Video Broadcasting Project) standard

**Fig. 18A**

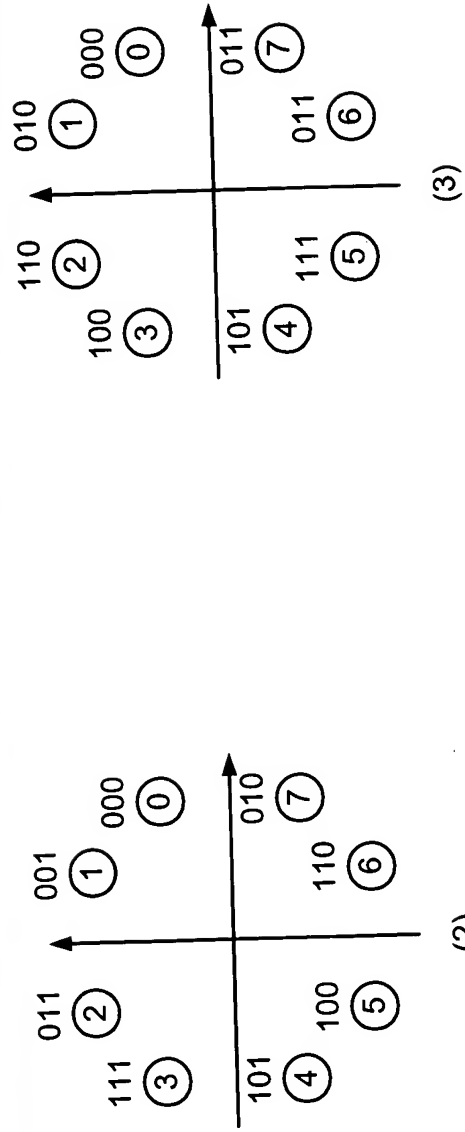


LDPC (Low Density Parity Check) coded modulation signal encoding

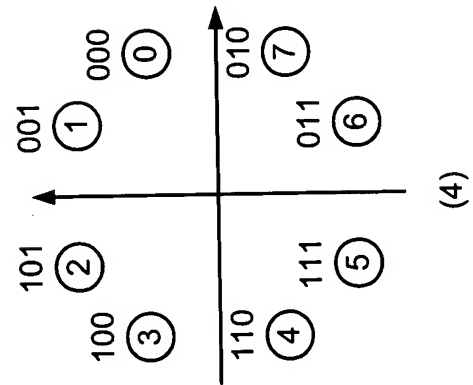
**Fig. 18B**



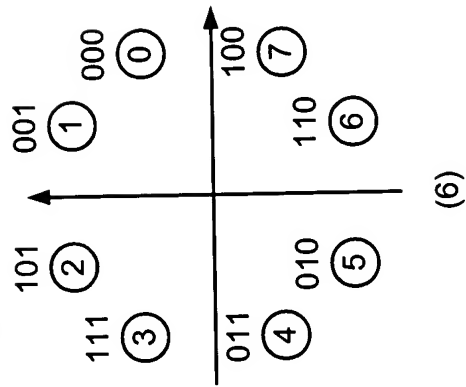
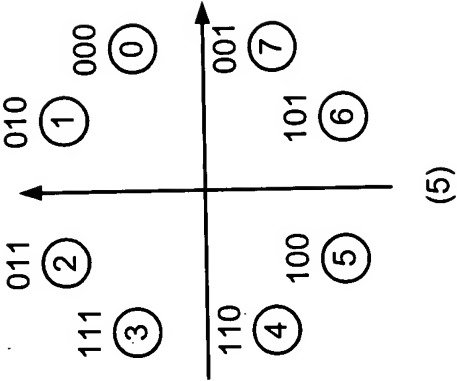
**Fig. 19A**



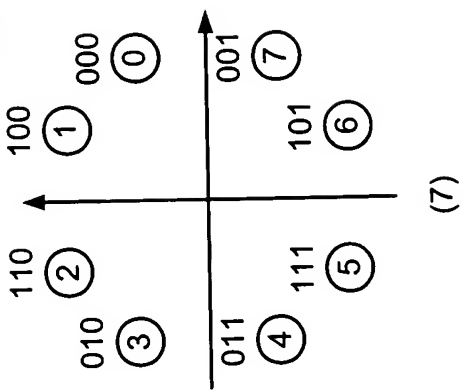
**Fig. 19B**



map 4 and map 5  
**Fig. 20A**



map 6 and map 7  
**Fig. 20B**



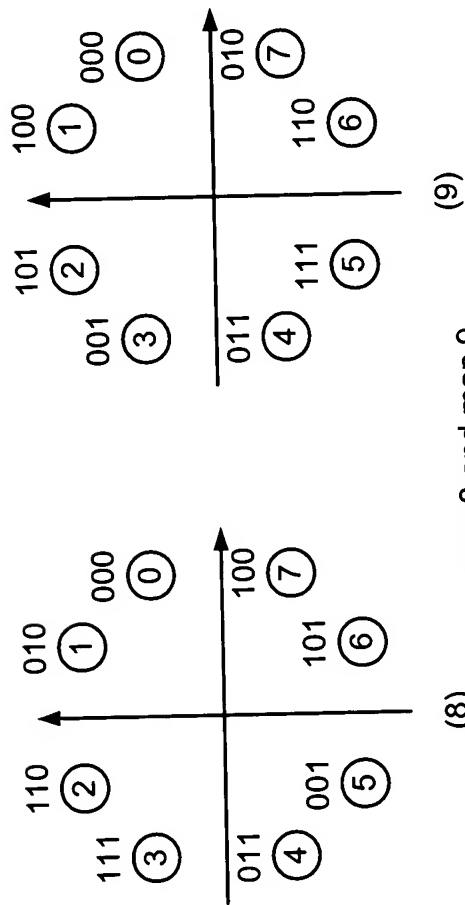


Fig. 21A

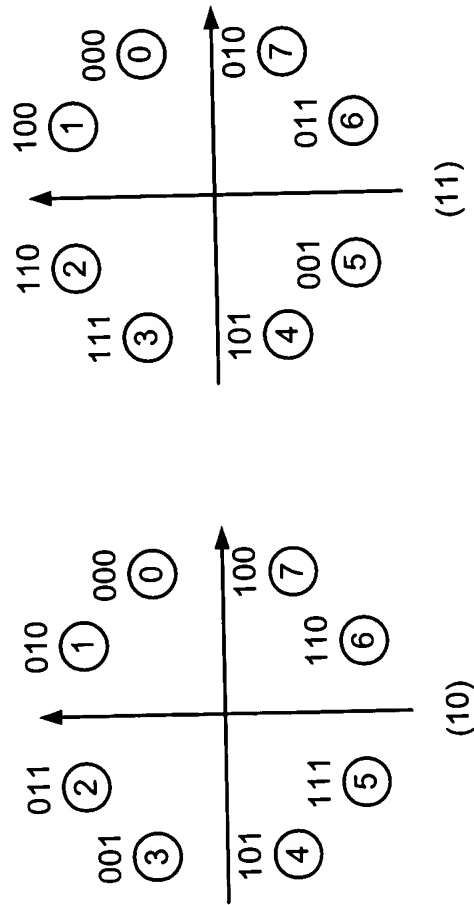
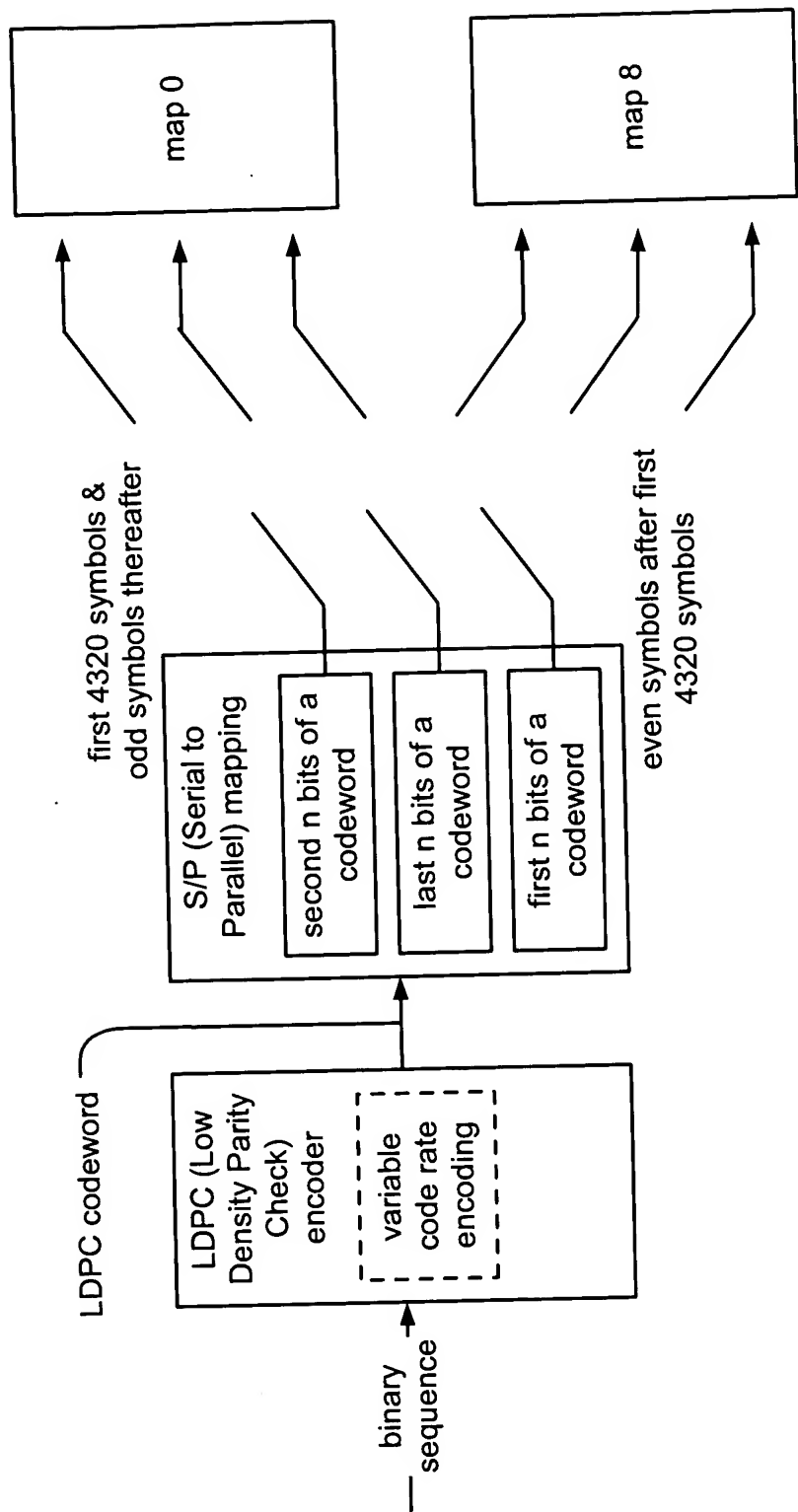


Fig. 21B

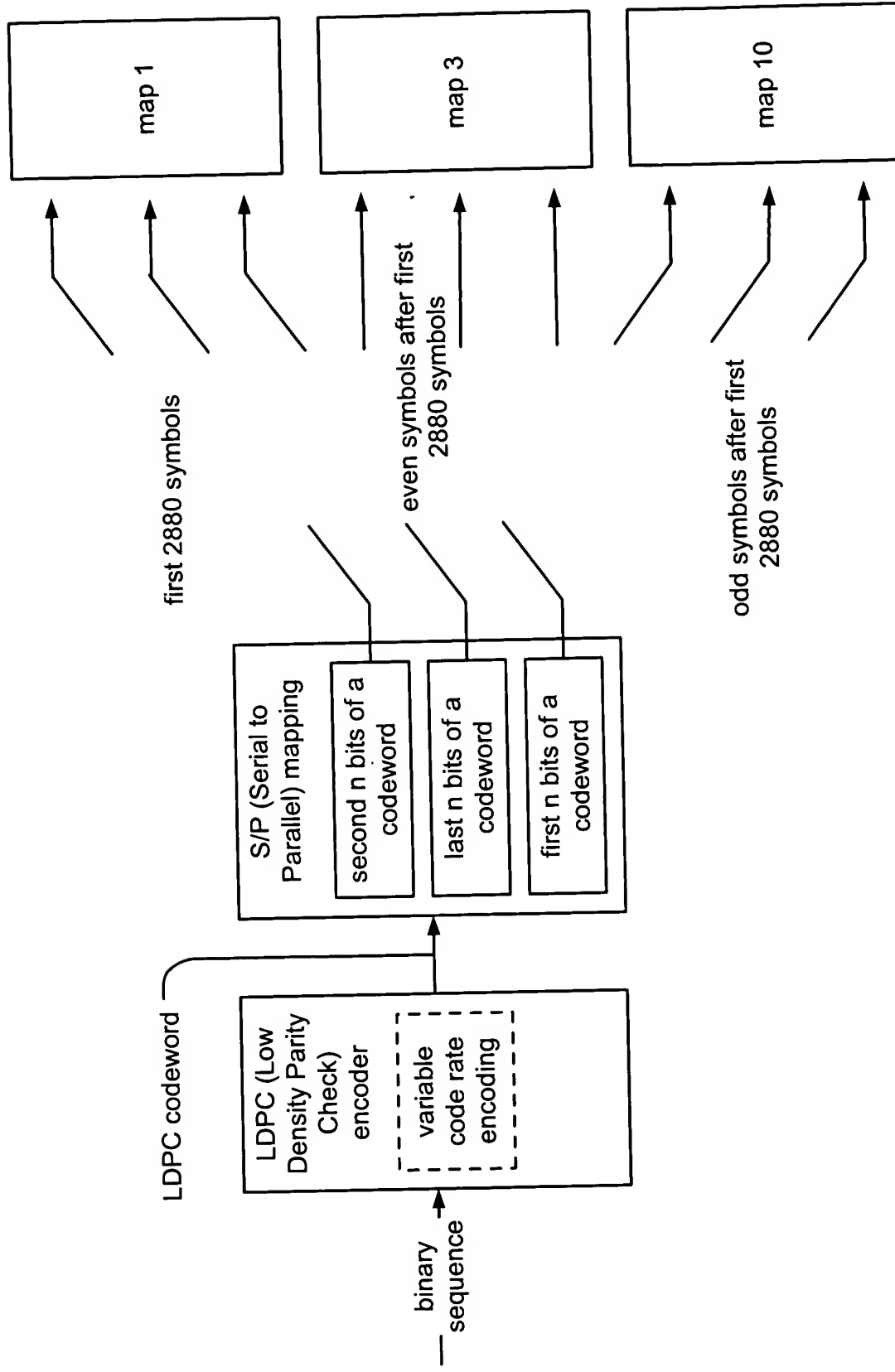
map number	# weak points at MSB	# weak points at ISB	# weak points at LSB
0	2	2	4
1	2	2	4
2	2	4	2
3	2	4	2
4	2	2	4
5	2	2	4
6	4	2	2
7	4	2	2
8	4	2	2
9	4	2	2
10	2	4	2
11	2	4	2

Table I  
Fig. 21C



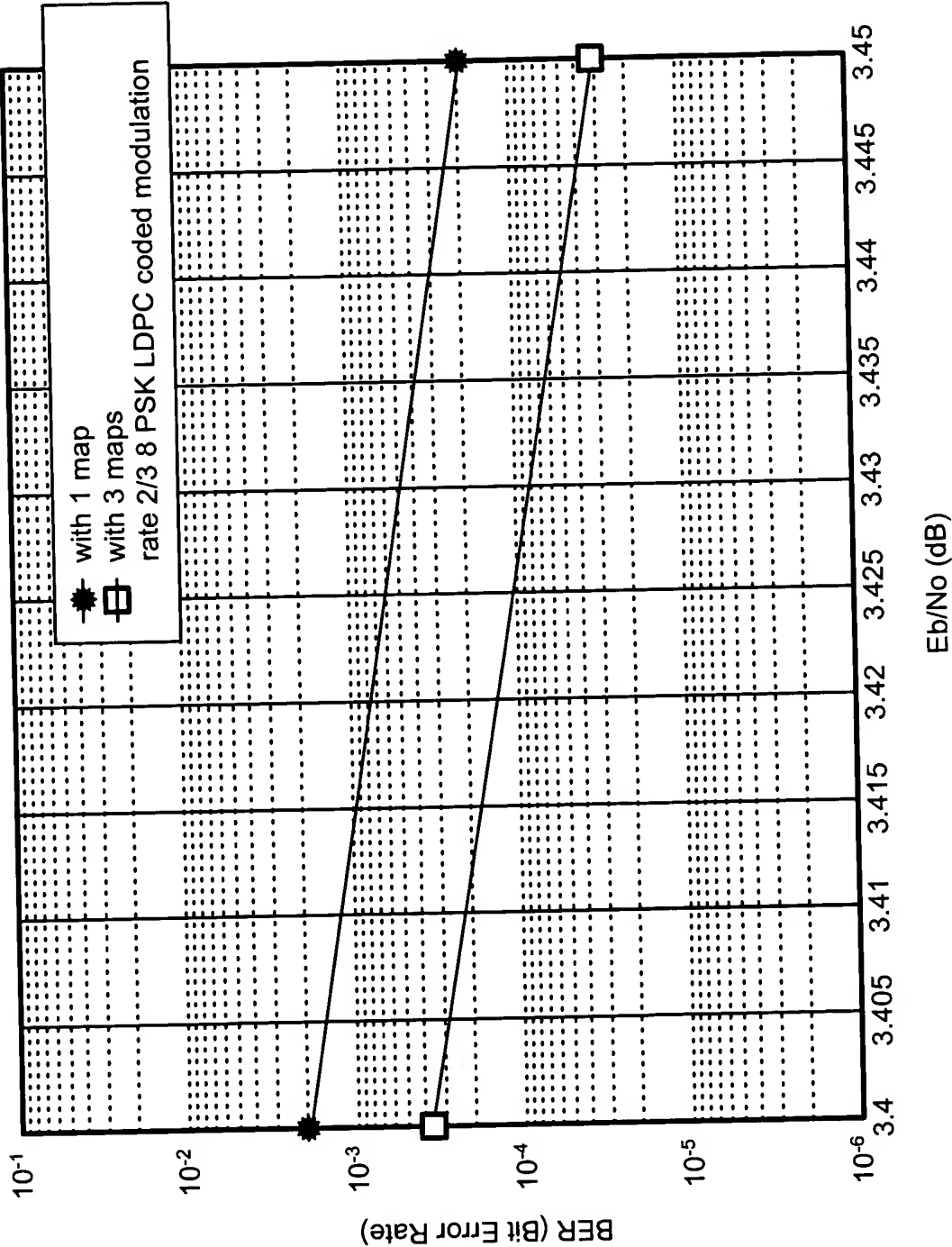
variable signal mapping LDPC (Low Density Parity Check) coded modulation system

Fig. 22



variable signal mapping LDPC (Low Density Parity Check) coded modulation system with code C<sub>2</sub>

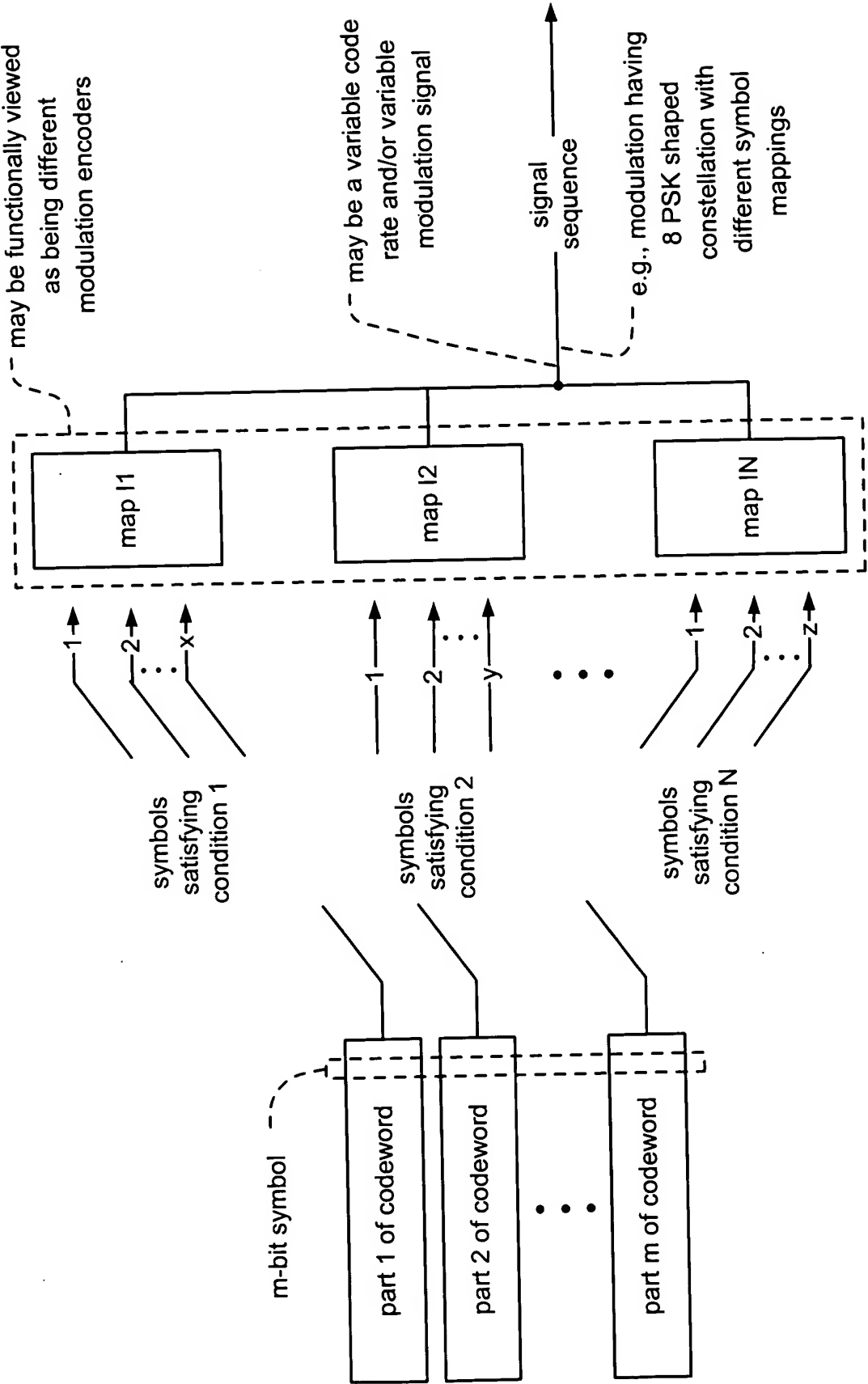
**Fig. 23**



performance comparison of single map vs. multiple maps (1 map vs. 3 maps)

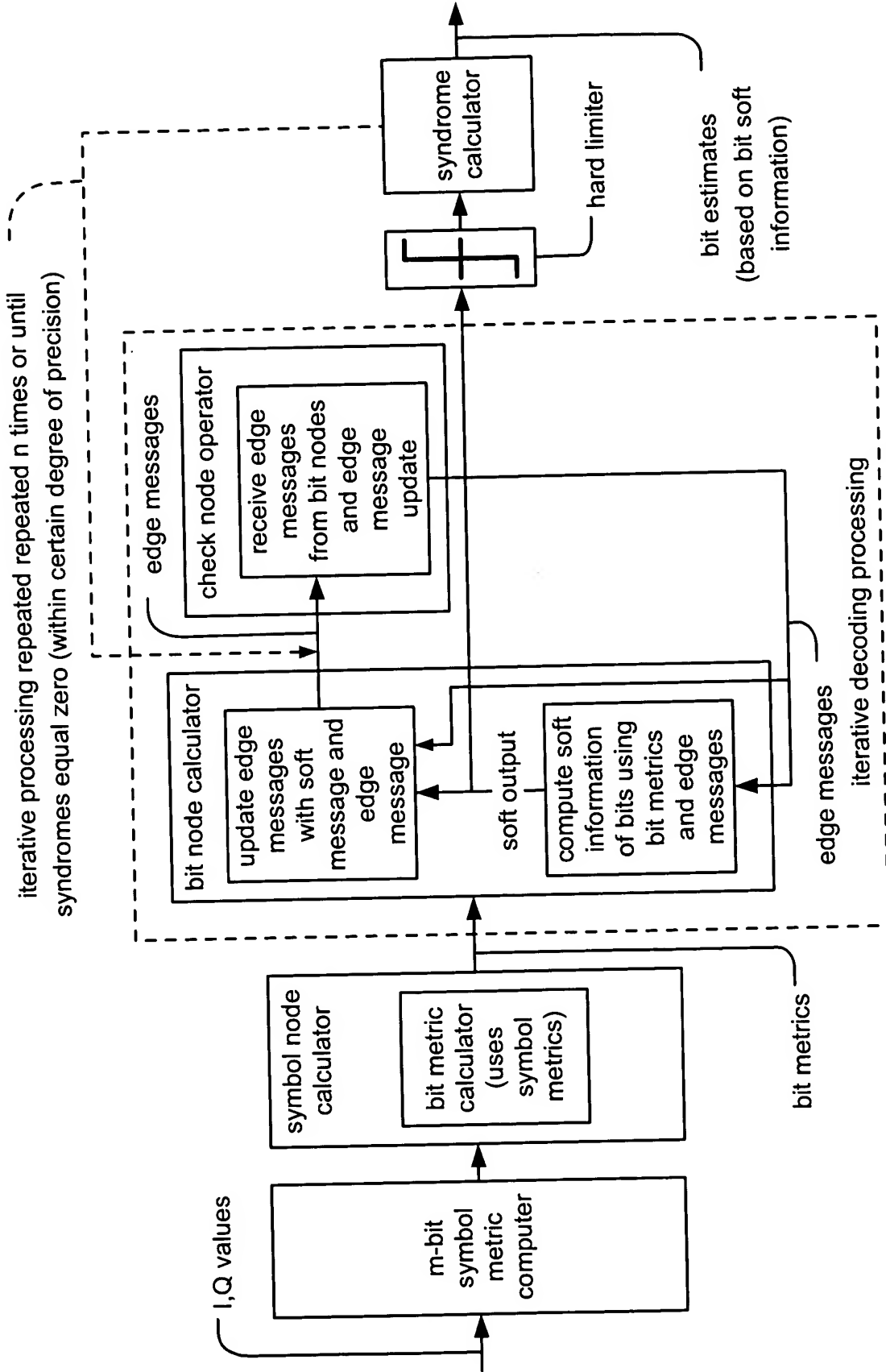
**Fig. 24**





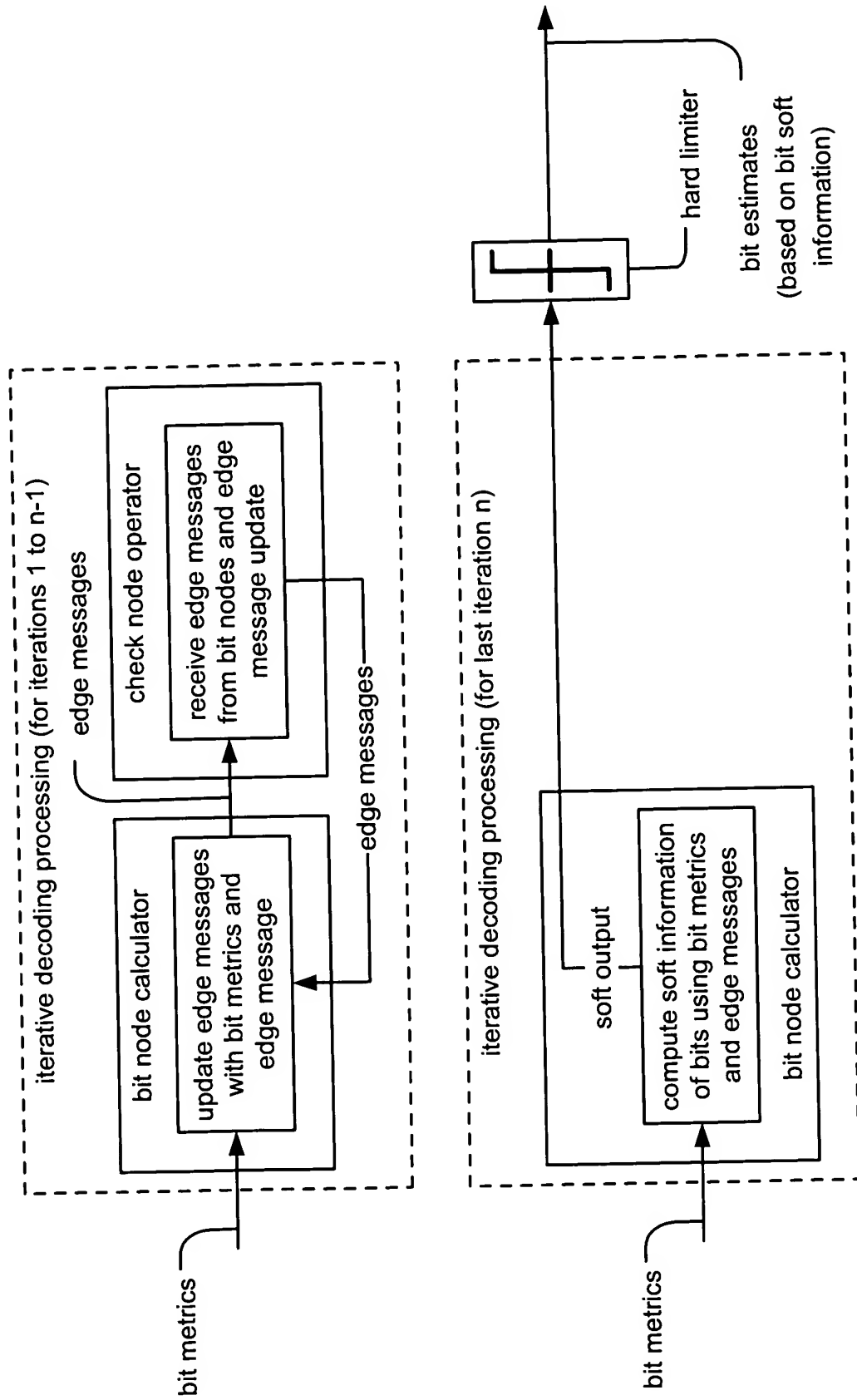
variable signal mapping LDPC (Low Density Parity Check) coded modulation system

**Fig. 25**



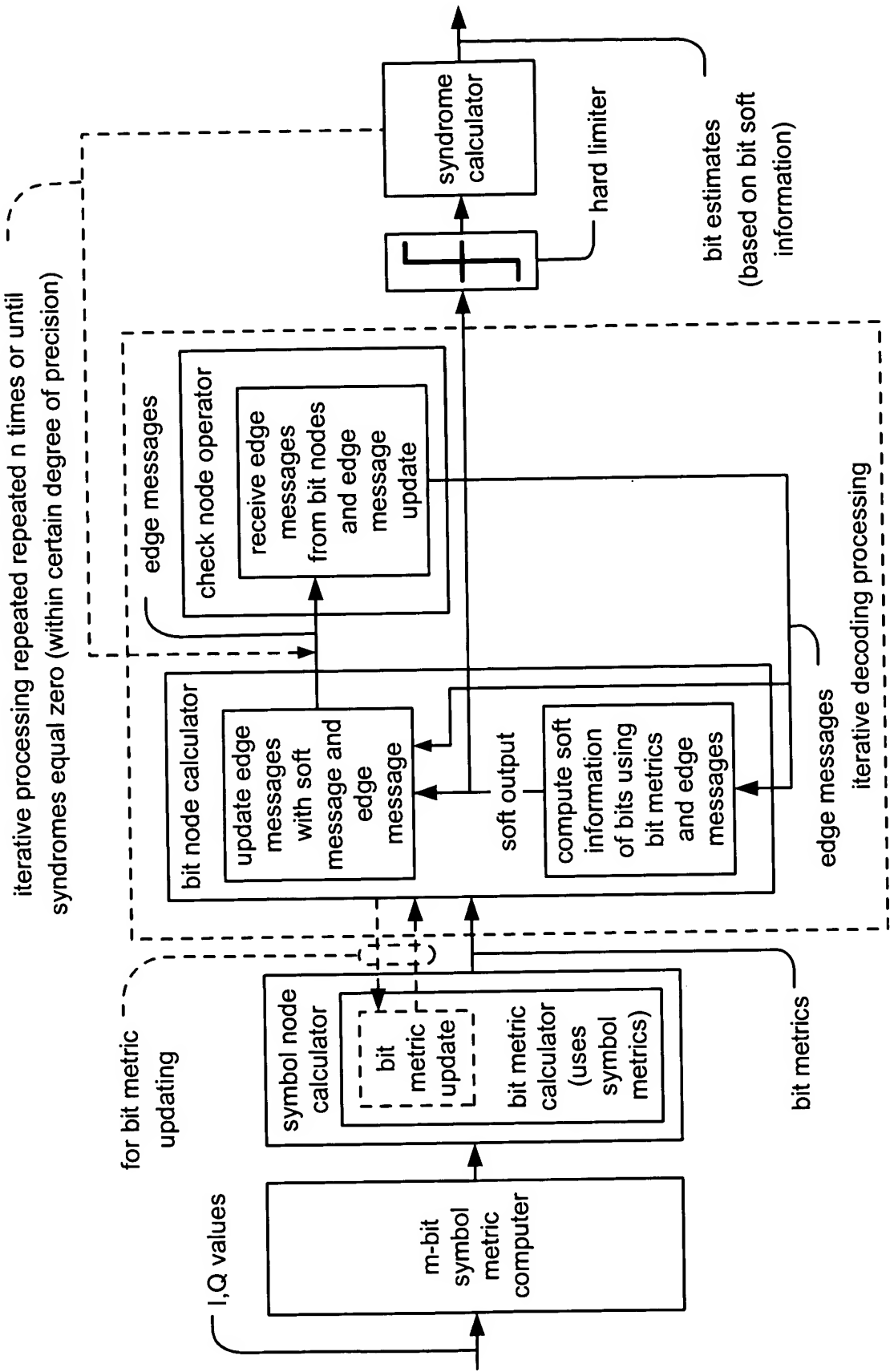
LDPC (Low Density Parity Check) coded modulation decoding functionality using bit metric

Fig. 26



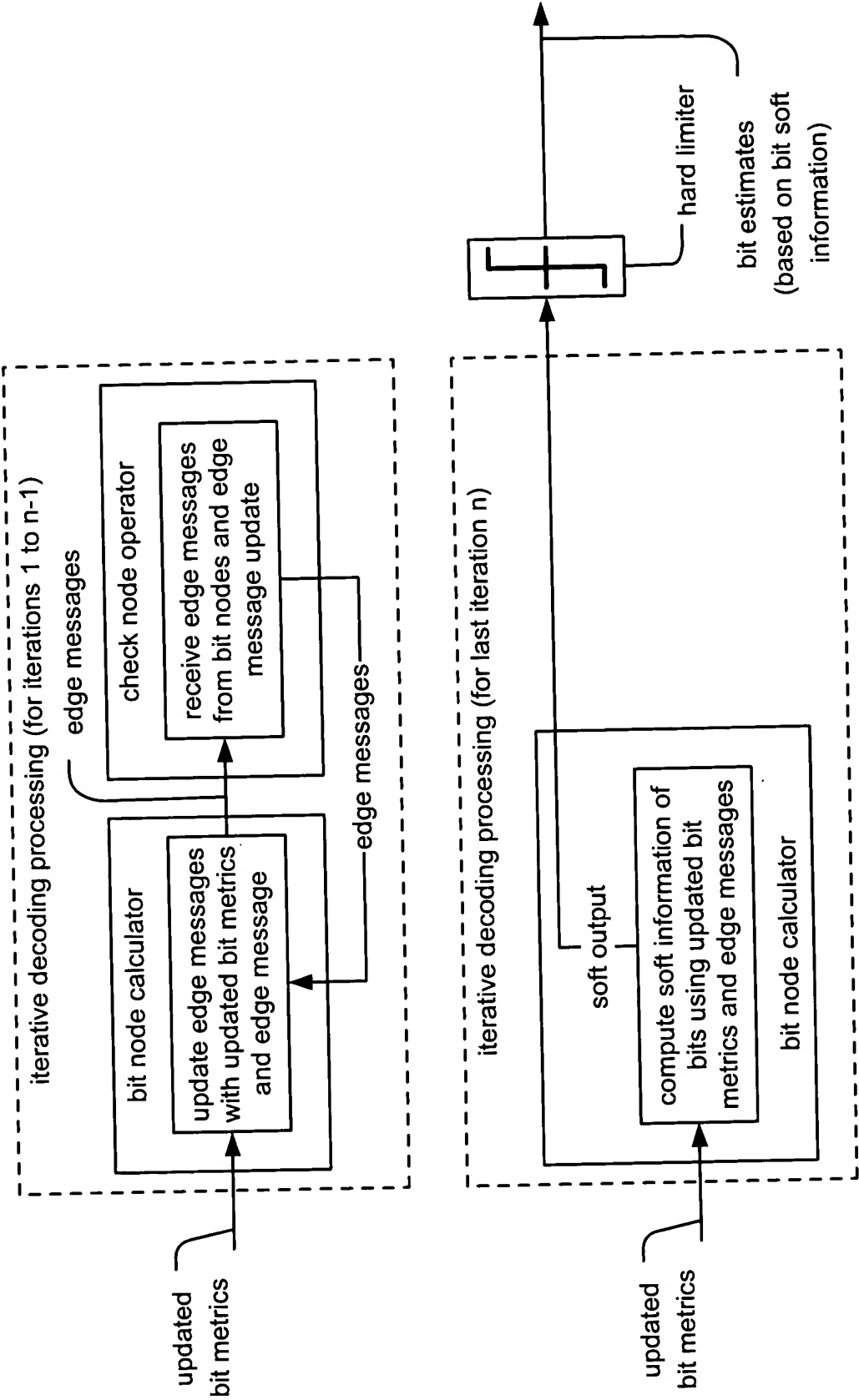
alternative LDPC coded modulation decoding functionality using bit metric (when performing n number of iterations)

**Fig. 27**



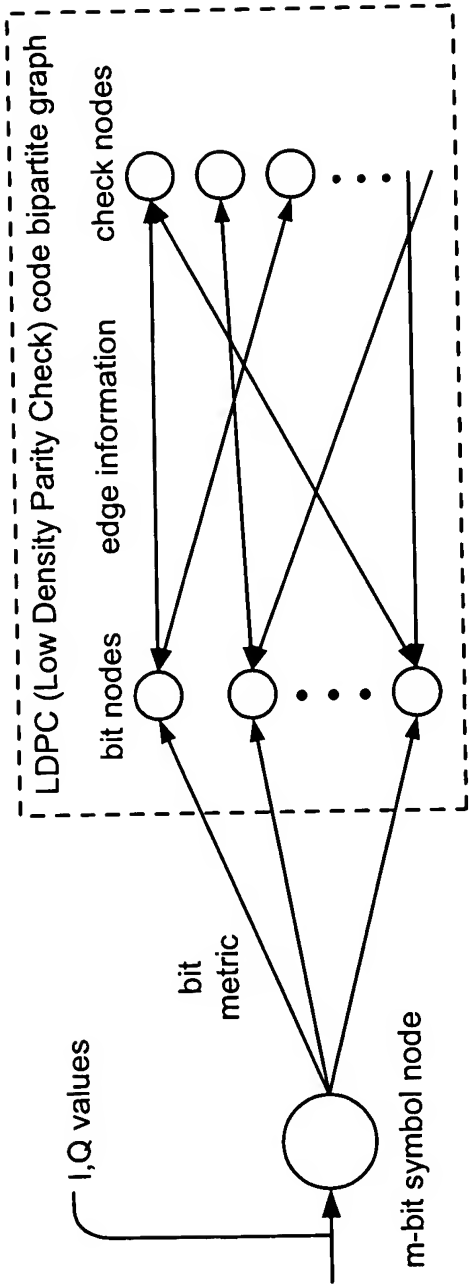
LDPC (Low Density Parity Check) coded modulation decoding functionality using bit metric (with bit metric updating)

Fig. 28



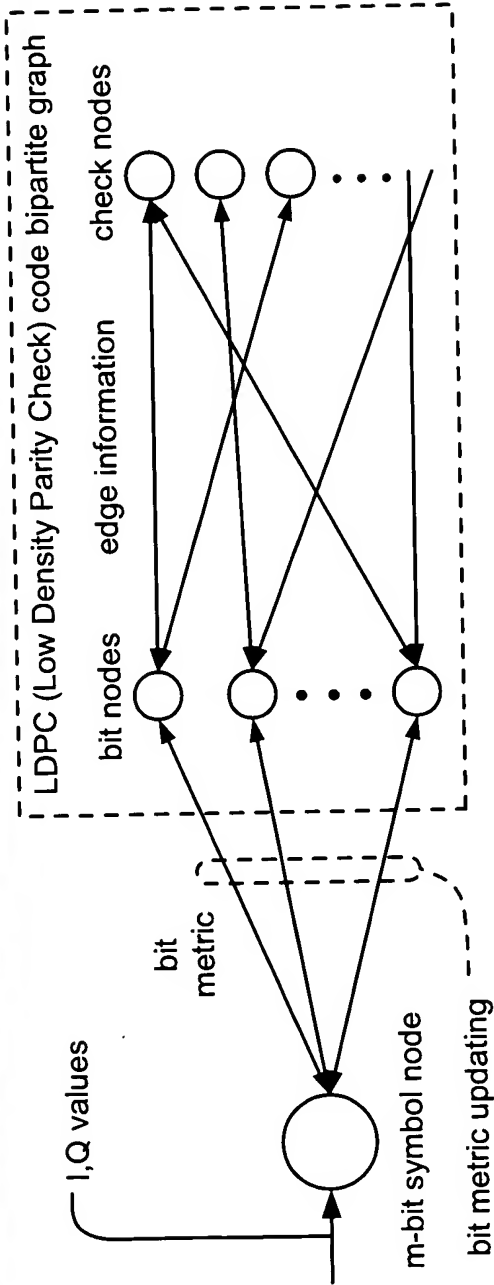
alternative LDPC coded modulation decoding functionality using bit metric (with bit metric updating) (when performing n number of iterations)

Fig. 29



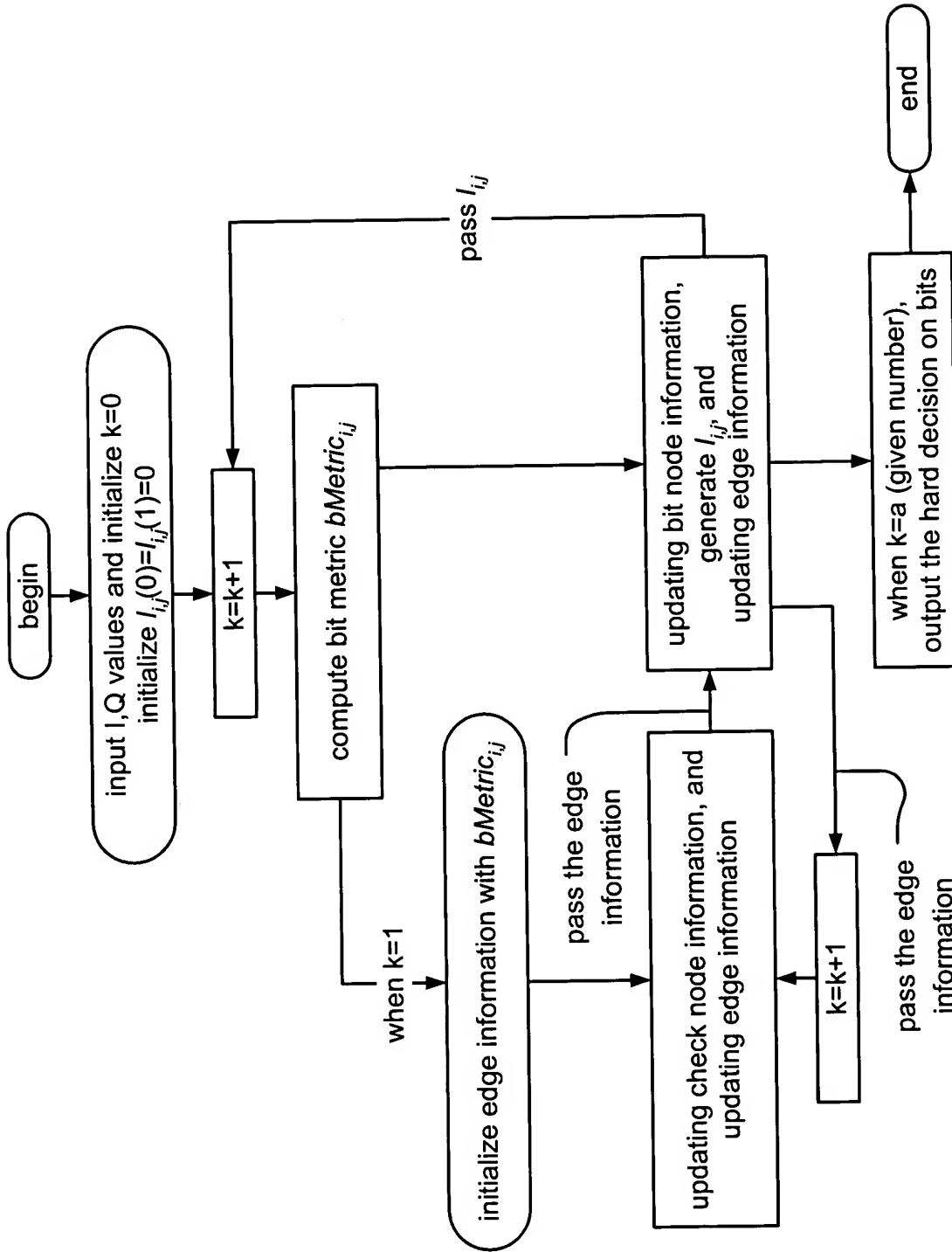
bit decoding using bit metric (shown with respect to LDPC (Low Density Parity Check) code bipartite graph)

**Fig. 30A**



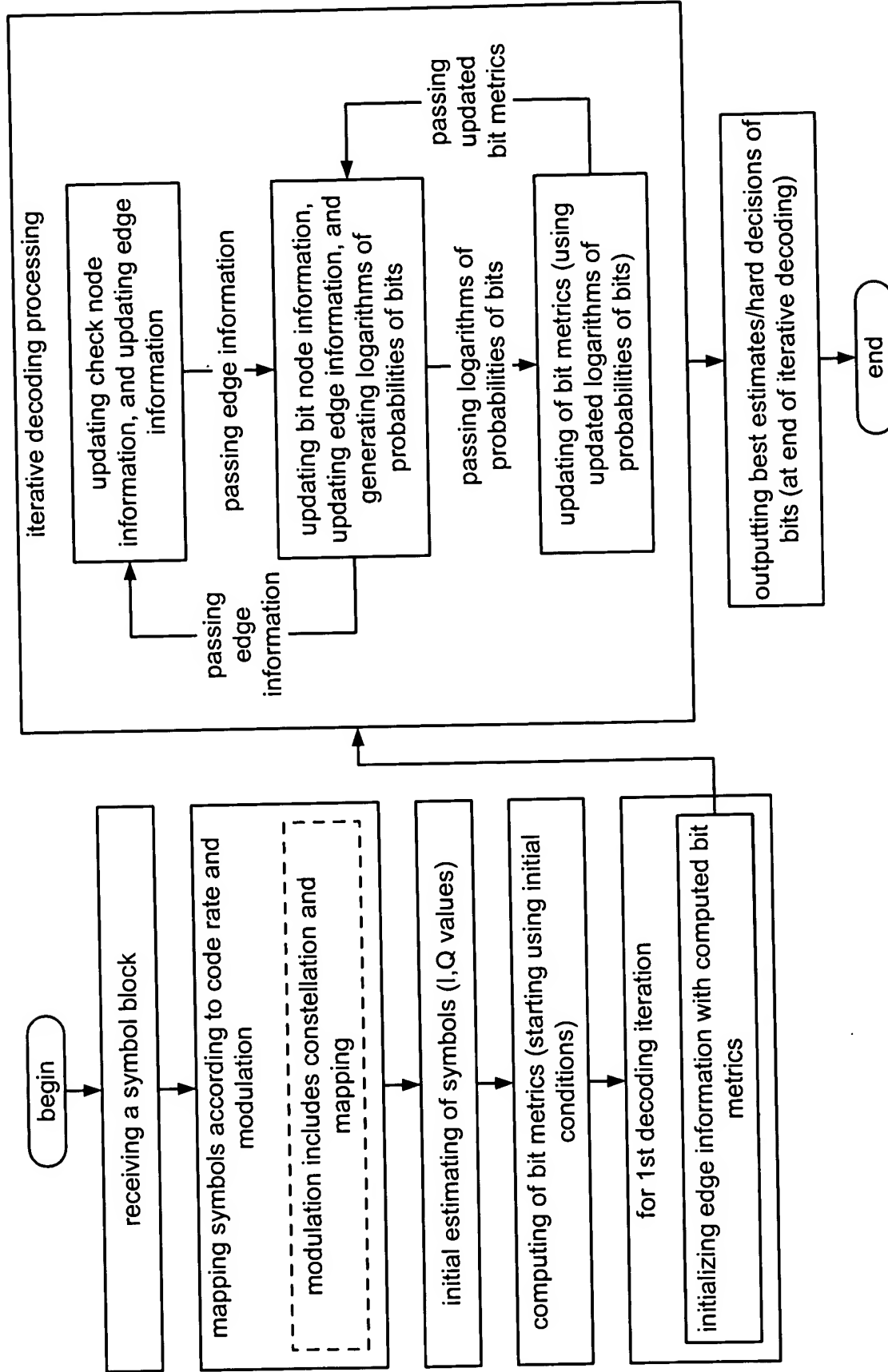
bit decoding using bit metric updating (shown with respect to LDPC (Low Density Parity Check) code bipartite graph)

**Fig. 30B**



flowchart of decoding LDPC (Low Density Parity Check) coded modulation signal with metric updating

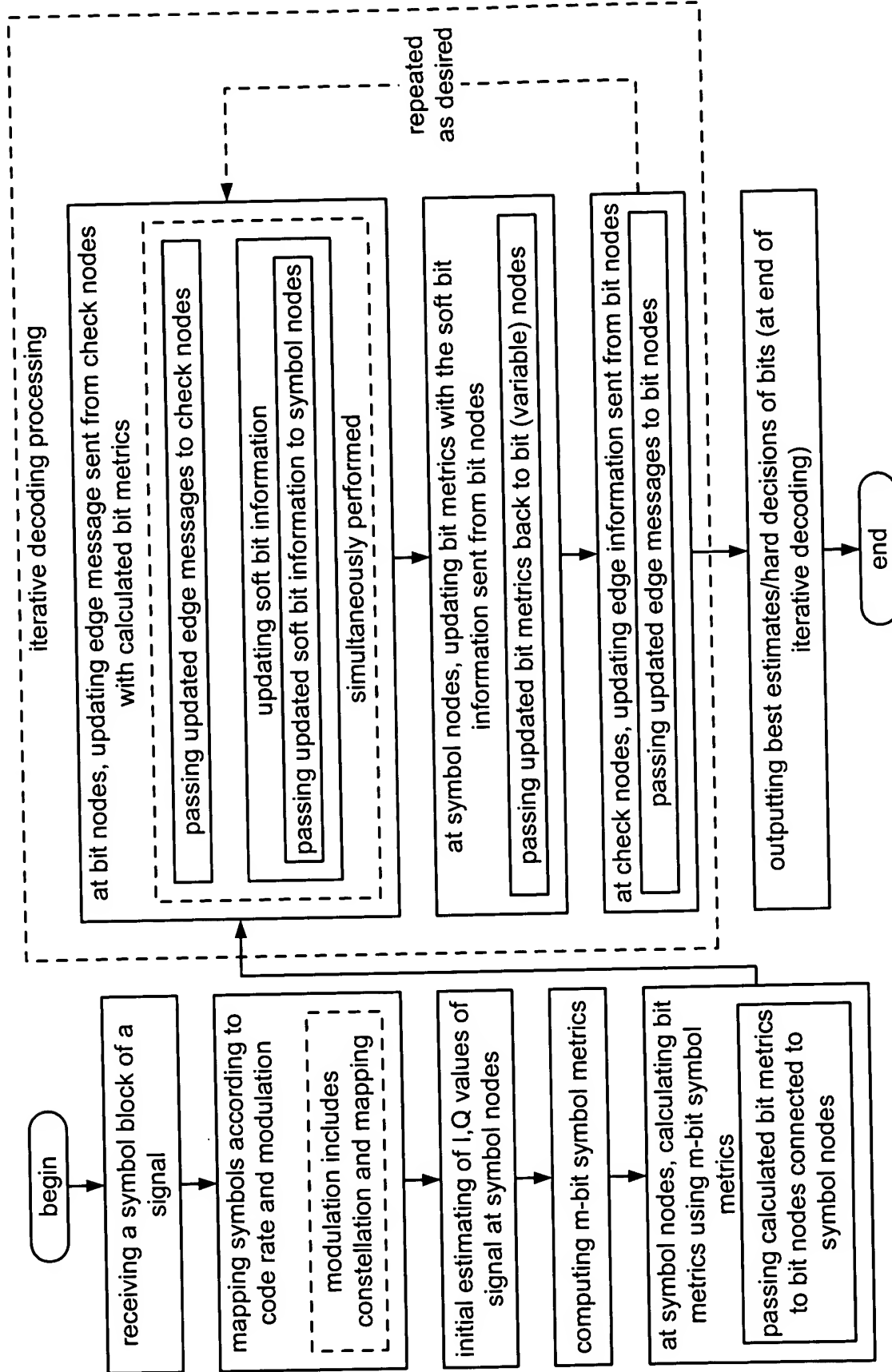
**Fig. 31**



method for decoding LDPC (Low Density Parity Check) coded modulation signal with update metric

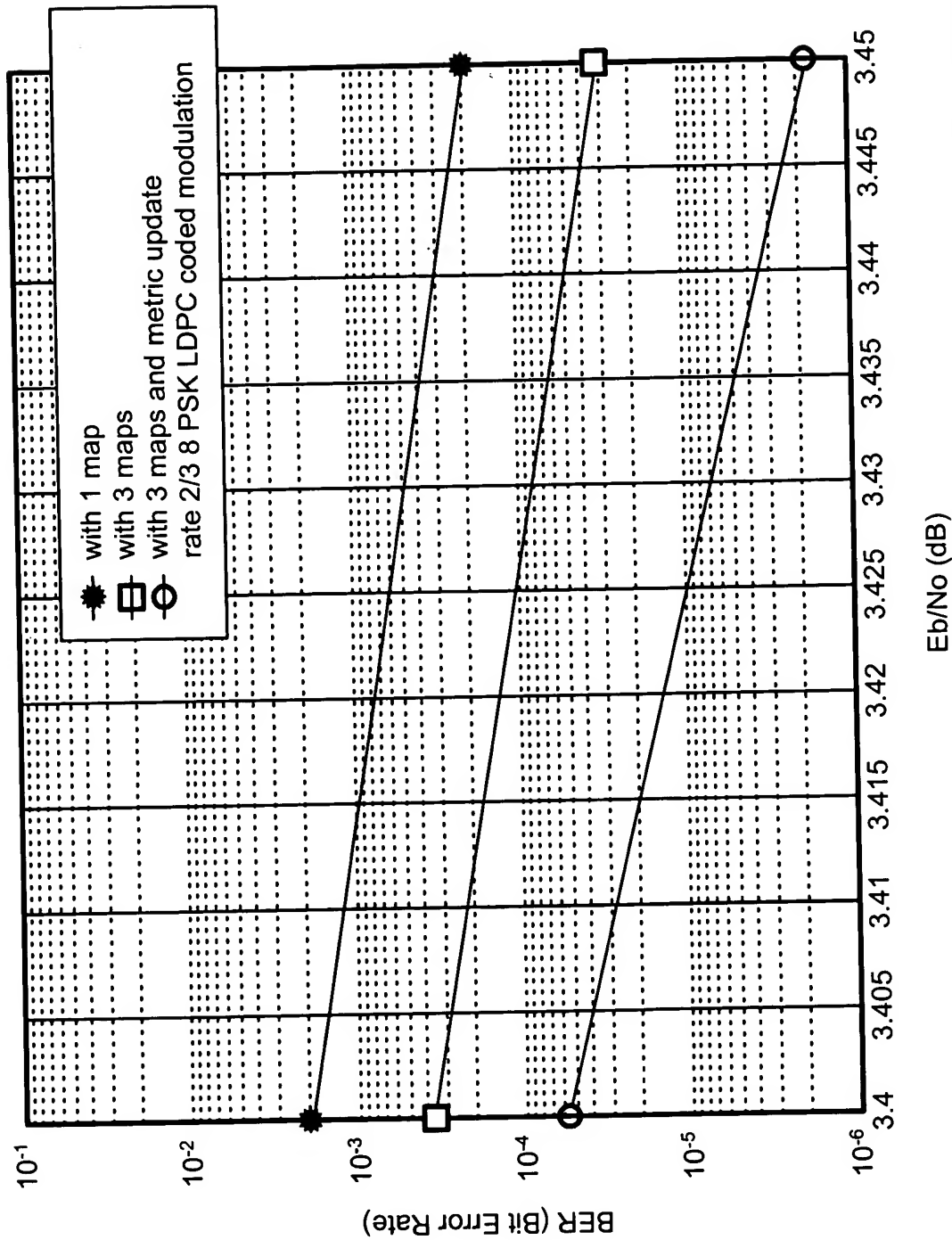
**Fig. 32**





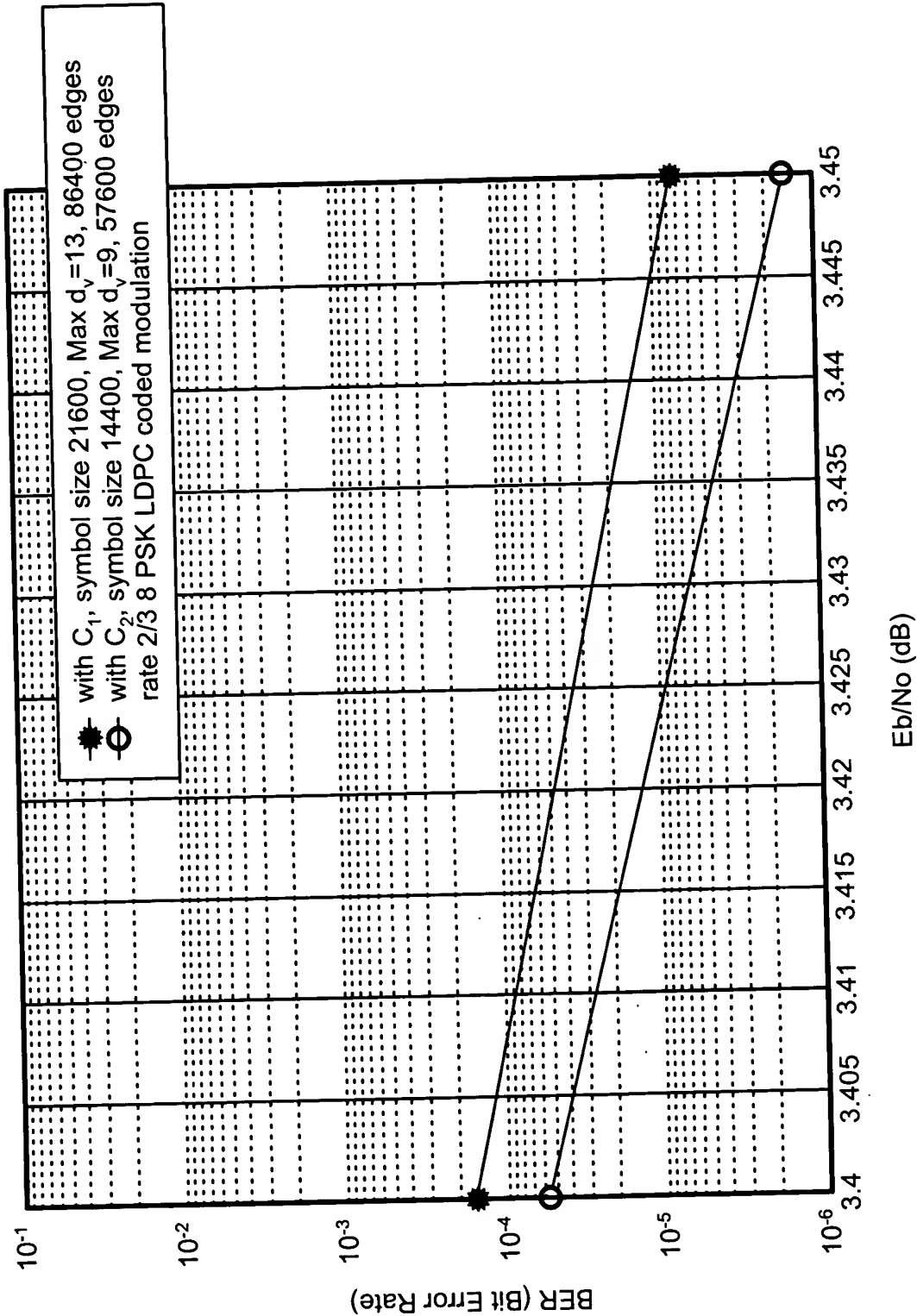
method for decoding LDPC coded modulation signal with update metric (see LDPC code bipartite graph of Fig. 26B)

**Fig. 33**



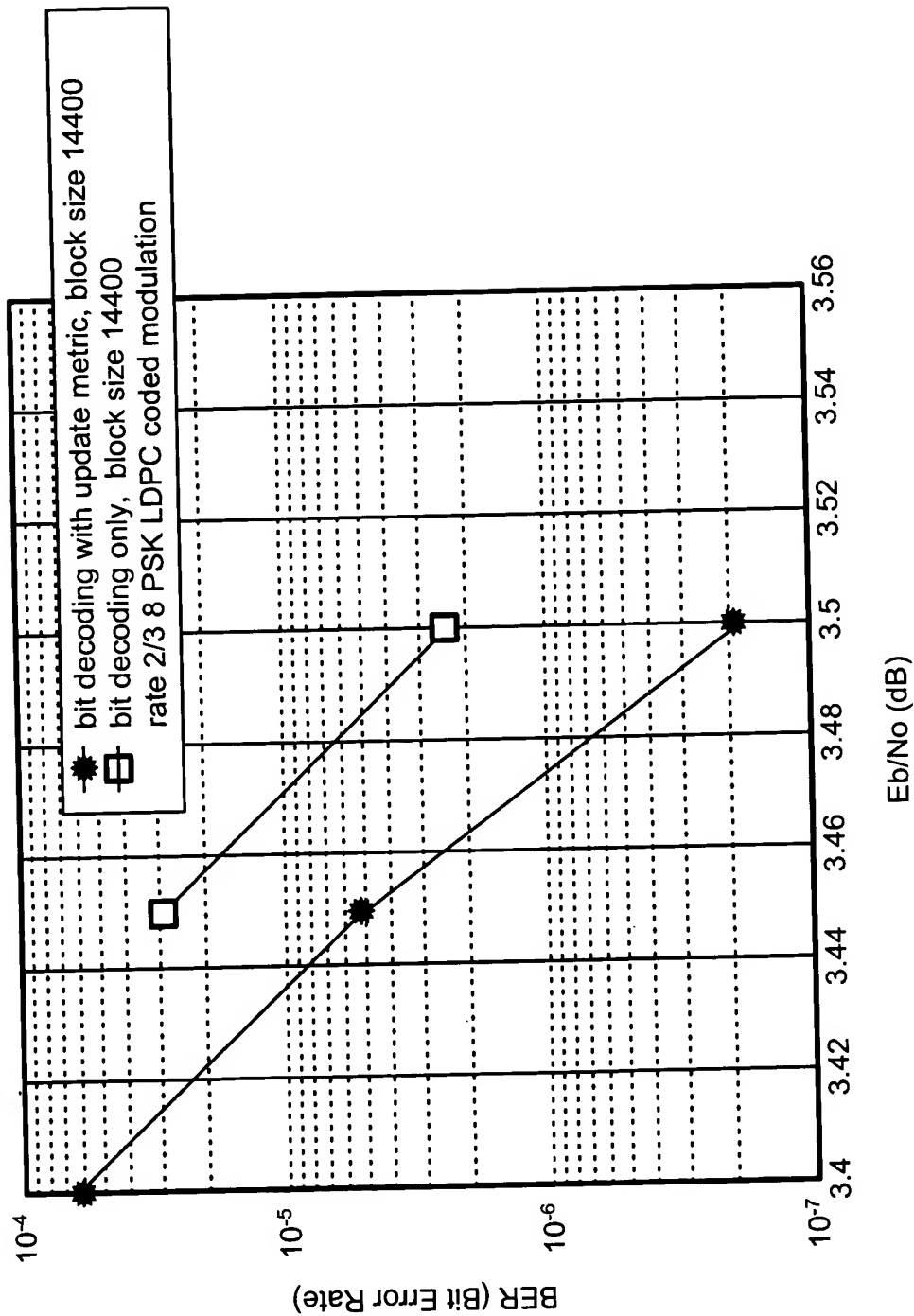
performance comparison of LDPC (Low Density Parity Check) coded modulation decoding processing for differently mapped signals (1 of which performs metric updating) (shown as using code C\_2)

**Fig. 34**



performance of LDPC coded modulation decoding of different symbol size  
(1. block with 21600 symbols, 3 bits per symbol and 2. block with 14400 symbols, 3 bits per symbol)

**Fig. 35**



performance comparison of bit decoding vs. bit decoding with metric updating of LDPC (Low Density Parity Check) coded modulation signals

Fig. 36